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THE
ART OF IMPROVING
THE
VOICE AND EAR;
AND OF
INCREASING THEIR MUSICAL POWERS,
ON
PHILOSOPHICAL PRINCIPLES.
ADAPTED TO
PUBLIC SPEAKERS, MUSICIANS, AND ACTORS,
AND PARTICULARLY USEFUL FOR THE
INSTRUCTORS OF YOUTH.

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THE
ART OF IMPROVING
THE VOICE.

A FINE-TONED voice for speaking or singing is, like poetical genius, the gift of Heaven; but the worst voice may, by the directions which we shall give, be astonishingly improved, and a fine voice may be preserved from being cracked and ruined,—an event by no means uncommon, as a consequence of ignorance or carelessness in the management of vocal efforts. We can promise much, though we cannot perform the miracle of making a bad voice equal, in delicacy and brilliant execution, to that of Mrs. Salmon; in graceful polish, to that of Vaughan; in thrilling melody, to that of Madame de Begnis; in richness and fulness of tone, to that of Miss Stephens; in spirit, to that of Braham and Sapio; or, in unrivalled power and majesty, to that of Catalani. Our remarks will

apply equally to public speakers, to whom the tones of the voice are no less important than to singers. But before coming to the practical part, we shall lay a secure foundation for our principles by dipping a little into the philosophy of the voice.—Those, however, who do not relish this, may pass it over, and return to it perhaps at some moment of future leisure for the study.

As very different views have been taken by philosophers of the mechanism of the voice, and as it has been usual to explain these by the analogy of musical instruments, we think we cannot better introduce our description of this mechanism, than by a sketch of the manner in which sound is produced, propagated, and modified, in wind instruments, especially in those which have the greatest similarity to the apparatus of the human voice.

WIND INSTRUMENTS.

In general, a wind instrument is formed by a straight or a curved tube or pipe into which the wind is thrown in a state of vibration, produced by various ingenious contrivances. It is possible, however, to conceive a wind instrument, constructed rather of musical strings than tubes, and it may be useful to bear this in mind. In the

mean time, we shall advert to two different orders of wind instruments; the one simple, and the other complicated by the addition of a vibrating plate, such as is usually formed of reeds.

MOUTH INSTRUMENTS.

Under this class we rank the horn, trumpet, flageolet, flute, and the flute tubes of the organ. In all these, the column of air is contained in the tube, which is the sounding body. In order that it may produce sound, it is necessary of course that vibrations should be excited; but the means employed for this purpose vary according to the kind of instrument. The length, size, form of the tube, the openings formed in its sides and its extremities, the force and manner in which the vibrations are excited, constitute the causes of the variety of sounds of different instruments. The nature of the substances of which they are formed, has only an influence over the distinctness of the notes produced. The theory of such instruments is precisely similar to that of the vibration of longitudinal musical strings. When we know the nature or physical condition of one of these instruments, we can determine with accuracy, by calculation, the sound which it will produce. There is nothing obscure in this theory, except some of the points relative to

the mouth-piece, that is, the manner in which the vibrations are excited.

It must be confessed, that between such instruments and the voice, there is no very evident resemblance; for though the sound of the voice is produced by the vibration of air in the tube of the wind-pipe, yet there is nothing analogous to the mouth-piece of the instrument, and the sound does not apparently depend much on the physical nature of the substance of the throat. The substances, indeed, composing the wind-pipe and the parts about the throat, are too soft and inelastic to rank as sonorous bodies.

REEDED WIND INSTRUMENTS.

In this class of instruments, we place the haut-boy, bassoon, the clarionet, and the martial bag-pipe. Such instruments may be divided into the reed, and the body, or tube; for the mechanical structure of the two parts are essentially different. The reed is formed sometimes of one and sometimes of two thin plates, which are susceptible of moving very rapidly, and the vibrations of which are destined alternately to intercept and transmit a current of air. This is the reason why the sounds thus produced are not governed by the same laws as those formed by elastic plates, free at one end and fixed at the other, which excite immediately

sonorous undulations in the open air. In reeded instruments, the reed alone produces and modifies the sound. If the reed be long, the motions are extensive and slow, and consequently the sounds produced are grave : a short reed, on the contrary, produces by necessity acute or sharp sounds, because the alternate transmission and repression of the current of air are more rapid. When we wish to draw from a reeded instrument a variety of sounds, it is necessary to vary the length of the reed ; and this accordingly is done by those who play upon the bassoon, clarionet, &c. when they wish to produce different sounds with these instruments. It may be added, however, as an important circumstance, that the elevation of the tone produced by an instrument depends in part on the elasticity, weight, and even the form of the reed, and the intensity of the current of air that plays upon it ; for when these circumstances vary, though the length of the reed remains the same, the tone is found to alter very considerably.

The reed is never employed alone, but is always adapted to a tube through which the air passes when it is forced through the reed ; and for this reason it is indispensable that the tube be open at both extremities. The tube seems to have no influence whatever on the tone of the sounds, but merely serves to modify their intensity and dis-

tinctness. Those tubes which produce the loudest sounds are of a conical form, which enlarge according to their distance from the reed, and their approach to the part where the air escapes. If the cone be reversed, the sound becomes dull; but if two equal cones, opposed base to base, are adjusted to a conical tube, the sound becomes round and strong. Philosophers have not hitherto given any intelligible reason for these modifications.

Only a definite number of determinate sounds can be produced by a column of air, vibrating in a musical tube. It is for this reason that a reeded instrument, when it is long, can only transmit distinctly those sounds which it is intended to produce; and it is also necessary to establish, at first, a certain proportion between the reed and the body of the instrument. When, consequently, we wish to draw a succession of different sounds from the same reeded instrument, it is necessary, not only to modify the length of the reed, but to modify also, in a corresponding manner, the length of the tube. Now this purpose is attained by piercing the sides of the bassoon, clarionet, &c. with small holes. By opening or closing these, we can make the reed and the tube bear such a proportion to each other as may be convenient. By means of the lips, likewise, this agreement enables us more easily to give the instrument the sound which we wish to

produce. This influence of the tube is most remarkable in those instruments which are narrow ; so far, indeed, does this go, that the effect produced by the reed is very imperfect, when the tube is not adapted to its capabilities. When the tubes are very large, on the other hand, as in organs, the reeds vibrate almost as freely as in the open air. We cannot, however, tell precisely what are the movements which take place in the air contained in such tubes, when they transmit the sound produced by the reed.

Such, then, are the instruments upon which we shall find that comparisons with the organs of the human voice have been instituted by philosophers. We shall now proceed to these organs themselves.

I.

ORGANS OF THE VOICE.

ACCORDING to principles similar to those which we have just observed in regard to musical instruments, the voice must necessarily depend upon a current of air, with organs to modify it so as to produce sound. The current of air is maintained and influenced by the lungs, and the diaphragm or midriff, with the muscles connected with the ribs and chest; for it is sufficient to the production of sound, that air collected in any receiver, such as the lungs, be driven out in a body with certain force, and that it meets on its passage with vibrators and elastic organs. Fishes accordingly, being deficient in those parts, can utter no sound,—a circumstance which led the celebrated Aristotle to divide animals into vocal and non-vocal.

It is scarcely necessary for us to give a minute description of the lungs, diaphragm, and muscles of the chest, to all which, however, we shall have to advert in considering the disorders and impediments of the voice, and the means of preserving and improving its powers; but, for the present, we shall only describe the immediate organ of the voice.

1.—THE LARYNX AND WINDPIPE.

The larynx is a most beautifully constructed organ, fixed upon the top of the windpipe, like a capital upon a pillar, and consisting of a cartilaginous or gristly box, the exterior projection of which is commonly known by the name of Adam's apple, as though it had sprung up in consequence of Adam's eating the forbidden fruit. This projection, however, it may be remarked, is very small, or altogether wanting, in females, and varies also according to age. As the larynx not only produces the sound of the voice, but is also the agent of its principal modifications of tone and pitch, it is indispensable, if we wish to understand the mechanism of the voice thoroughly, to be well and accurately acquainted with its structure and organization. In consequence of not paying a sufficient attention to this point, very imperfect, and even false ideas, have been propagated on this interesting subject. We shall therefore go more particularly into detail upon those parts which are most necessary to be known, and many of which are at present but little understood, even by the learned.

THE BONE AND GRISTLES OF THE LARYNX.

At the root of the tongue lies a small crescent-shaped bone, or rather somewhat in the shape of a

horse-shoe, which, from its resemblance to the Greek letter *υ*, is called the *hy-oid* or *u-like* bone. From this bone the tube of the wind-pipe takes its rise, and proceeds downwards to the lungs. The two ends of the hyoid bone may be obscurely felt externally in a lean person, below the jaw and nearly under the ear on each side. It is unconnected with any other bone, and, in this respect, is different from all the other bones of the body. The bend of this bone in the front, lies immediately above Adam's apple.

The tube of the larynx, short as it is, consists of five pieces, composed of gristle or cartilage, thin and elastic, united by membranes, and moved on one another by many little muscles. Of these pieces, however, only three are concerned in the production of the voice. The part called Adam's apple, denominated by anatomists the *thyroid cartilage*, from its resemblance to a shield, does not form a complete ring of itself, but the interruption is filled up in order to make a complete ring with two other pieces of similar gristle, but of smaller size and power; these are called the *arytenoid cartilages*, because they are thought to resemble a funnel. These are supported by a fourth, which constitutes the basis on which they execute their motions; it is narrow before, and broad behind, and has some resemblance to a seal-ring, on which account ana-

tomists have termed it the *cricoid cartilage*. This, then, is the skeleton, or frame-work, of the larynx.

The thyroid cartilage is articulated or joined with the cricoid by the extremity of its inferior horns; but during life, contrary to the received opinion, the thyroid is fixed relatively to the cricoid cartilage. Each arytenoid cartilage is articulated with the cricoid, by means of an oblong *facette*, and is concave transversely. The cricoid presents a *facette*, the disposition of which is analogous to that of the arytenoid cartilage, with this difference, that it is convex, where the corresponding part of the other is concave. Near the articulation is found a small synovial capsula, closed before and behind, but loose at the sides.

The larynx, thus constructed, is narrowed or dilated in a variety of ways by the antagonist powers of different muscles, which, says Blumenbach, may be moved altogether or separately, according to the variations of the voice. This, Mr. Abernethy, in his anatomical lectures, denies; affirming that no separate motion can take place, and that all the parts must move simultaneously. The articulations above described will only permit the arytenoid cartilages to move laterally upon the cricoid; and all motion backwards or forwards is impossible, as well as a certain see-saw motion mentioned in some books, whose authors ought to know better.

The chief motion of the larynx, therefore, is not in its parts, but as a whole, which, by the aid of its muscles, can be elevated or depressed, carried forwards or backwards, &c.; which movements may readily be felt externally, by placing the finger on the fore part of the throat while speaking or singing.

The larynx is lined internally with a very sensible, vascular, and mucous membrane, which is a continuation of the membrane of the mouth. It is of great importance to keep this in view, as it is owing to its becoming irritated or inflamed, and throwing out a quantity of tough phlegm, that hoarseness arises, and other disorders of the voice.

We need scarcely remark that all these parts are well supplied with blood-vessels and nerves, the latter of which are four in number, and give off several branches to the muscles and to the lining membrane, endowing them with exquisite sensibility. Dr. Gall calls them the *vocal nerves*.

THE GLOTTIS, OR ENTRANCE OF THE WINDPIPE.

The orifice of the windpipe is partly formed by the cartilages of the larynx just described, and partly by the vocal chords and the arytenoid muscles. It presents a longitudinal opening or chink, about two-thirds or five-sixths of an inch long,

and about a fourth or a sixth of an inch wide—being larger behind than before, where the two sides approach, so as to touch at the point where they are inserted into the thyroid cartilage. In birds and reptiles this opening is capable of being so completely closed, as to prevent the smallest drop of water penetrating it, except with the will. It is in this way frogs confine the air in the lungs, and live without inspiration for a considerable time.

The orifice of the larynx is guarded by a moveable valve or lid called the *epiglottis*, which from its elasticity stands always open, except during the act of swallowing. When a morsel of food passes from the mouth to the gullet, it presses down the valve over the mouth of the windpipe, in the same way as a flute-key covers the stop of a flute, and the windpipe is thus kept free from accident: but for this beautiful contrivance, (since every morsel swallowed has to pass over the mouth of the windpipe,) the breath would not only be interrupted, but fatal accidents might ensue. Providence, however, is inexhaustible in substitutes and means of reparation, for M. Magendie saw two instances in which the valve was wanting, and in which swallowing was easily performed, by the windpipe being shut laterally. Sometimes a little liquid or a small particle of food gets under the valve, and ex-

cites violent coughing, till the offensive matter be expelled. Few serious accidents, however, happen from this cause. Not two guests, as Paley observes, are choked in a century. So effectually, indeed, does the epiglottis guard the entrance of the windpipe, that whilst morsel after morsel, draught after draught, are coursing one another over it, an accident of a crumb or a drop slipping under it, though it must be opened for breath every second, excites surprise by its novelty, or alarm by its danger.

THE VOCAL CHORDS.

When the arytenoid cartilages are brought together, so that their internal surfaces touch one another, the glottis, or opening of the windpipe, is diminished about one-third of its length. It then presents an opening not more than from one twenty-fourth to one-twelfth of an inch in width, and about half an inch in length. The sides of this opening, we may call the lips of the glottis: they present a sharp edge, directed upwards and inwards, and are principally formed by a muscle, and by a ligament that covers or sheathes the muscle, to which it is strongly attached, while the ligament itself is covered by the common lining membrane of the larynx, and essentially forms the thin cut edge of the lips. These lips may be called with great propriety the vocal chords, or reed of the instrument,

as it is their vibration which causes the sound of the voice.

Above the lower ligaments of the glottis are situated the ventricles of the larynx, the cavity of which is considerably more spacious than it at first appears. The outer, under, and upper sides of this cavity are formed by the muscle that constitutes the vocal chords, turned upon itself. The extremity, or front side of the cavity, is formed by the thyroid cartilage. By means of these ventricles, the lips of the glottis are perfectly insulated at their upper edge.

If we examine above the opening of the ventricles, we shall find two bodies which have a great analogy in their arrangement to the vocal chords, and form a second glottis above the first. This apparatus is formed by the upper edge of the vocal chords, a little fatty cellular tissue, and the common lining of the larynx, which covers them before entering into the ventricles.

THE WINDPIPE AND ITS BRANCHES.

The tube which conveys the air to the lungs may be considered as a regular continuation of the larynx, being composed of gristly rings, united by a muscular coat which sheathes the whole, and lined by the same mucous membrane, which is continued from the mouth. There is, subjacent to

this, a nervous layer or coat which renders it very sensible, though the cartilaginous rings, while in a state of health, are almost destitute of feeling, (no nerves being traceable into their substance,) and for that reason do not readily inflame, nor suffer irritation. It may be remarked that the gristle which composes the rings of the windpipe is fibrous rather than hard and brittle, and it will consequently bend, without breaking, in any direction. They are also elastic along with this property of suppleness, and recover their position when forcibly distended or contracted. Distinct from this property, though analogous to it, is the extensibility and contractibility of the rings from causes acting *slowly*, such as the pressure of a tumour or of a tight neck-cloth. This property is of great importance to be recollected in the management of the voice, with regard to its improvement or preservation.

When the windpipe enters the chest, it divides itself into two branches, one going to the right lung and the other to the left. These branches are again subdivided into a great many twigs, which become gradually smaller, and lose their gristly and ringed structure as they dip deeper into the substance of the lungs, till at last their extreme divisions terminate in the small cells which form the chief part of the substance of the lungs, and alternately receive and emit the air we breathe : the shape and magnitude of the cells are va-

rious, but they are all united by the common yet delicate mucous web, which is the general connecting chain of the whole body. Keil calculated that the number of these air-cells in one of the lungs of a healthy man was 1,744,000,000: this is, in all probability, greatly exaggerated, but we know that in a healthy individual the lungs will contain during a strong inspiration about 120 cubic inches of air.

2.—THE MOUTH AND THE PARTS ADJACENT.

Authors who have treated of the organs of the voice have paid too little attention to the parts above the vocal chords, which the sound traverses after it is produced; but as these exert an important influence on the character of the sound in clearness and intensity, it becomes, we think, indispensable to examine their structure. The first of these in order of situation are,

THE TUBES OF THE EARS.

A little above the valve of the orifice of the windpipe, on each side of the root of the tongue, is a small opening leading to a tube which communicates with the ear, and is supposed, so far as the ear is concerned, to serve a similar purpose to the air-holes of a violin or of a drum. With regard to the voice, these tubes appear to perform a very distinct part in rendering the sound clear and free;

for the instant that the tubes are obstructed or closed by accident or disease, the sound of the voice appears dull and muffled. The utility of the tubes to the clearness of the voice is farther demonstrated, from the circumstance that the orifice of the tubes is always opened as a consequence of opening the mouth,—Providence having evidently constructed them in this manner for the aid of speech. The ear, indeed, being formed of very hard bone, and containing the sonorous membrane of the drum, the sound of the voice entering it through the air-tubes must necessarily be increased by its passage along what we may perhaps be allowed to call the whispering galleries of the ears. It is necessary to mention that these air-tubes are lined by the same mucous membrane which lines the nose, the mouth, and the windpipe, and of course are equally liable to be affected with colds, and obstructed, like the nostrils, by swelling and inflammation, or by an increased discharge of mucus.

THE NASAL PASSAGES.

The effects produced on the voice by different states of the nasal passages is a matter of common observation; but in order to understand the matter thoroughly, it will be requisite to describe these. The nose is a double channel for the passage of the

air in breathing, the opening of which is always free. This circumstance, as Bichat remarks, distinguishes it from all the other external openings in the body, and is of much importance in breathing as well as in speaking; for it is thus prevented from accidental obstructions, arising from palsy or other diseases. In hysteric fits, and other convulsions, accordingly, when the windpipe is partially constricted, the nostril remains open to admit the air as soon as the constriction is removed. The nostril remains open also in the dreadful affection of locked-jaw—when the teeth will not admit the blade of a knife between them.

The more external part of the nostrils is larger, longer, and less winding and oblique, than they become farther inwards. The middle part, which begins about an inch from the outer orifice, is much narrower, but of greater extent from the roof to the floor of the nostril. It is indeed so narrow, that the least swelling here obstructs the air in breathing, as in the case of colds. The innermost part of the nostrils is united into one channel, which opens into the back part of the mouth, immediately over the opening of the larynx. It is more narrow and oblique, and much shorter, than the two former portions above described.

The middle and the innermost parts of the nostrils open into several hollows or cells in the

adjacent bones of the face and forehead, and communicate freely with them. In each cheek-bone, for example, is a hollow of this kind, called the cells of the cheeks, or the caves of Highmore, from the person who first described them. These cells are situated in the parts of the cheek-bones which bulge out at some distance below the inner corners of the eyes, extending nearly to the upper jaw. Behind what is commonly called the root of the nose, and between the inner corners of the eyes, are four or more cells, somewhat like a honey-comb, which open into the upper part of the nostrils, by many small tubes, placed one above another in a transverse position. Two other similar cells are formed in the bone which constitutes the eye-brows, and communicate with the nostrils, by openings in the bones. There is also a cell of the same kind immediately over the roof of the mouth, and others more inward in the bones of the skull.

All these cells open into the inner part of the nose; the lower and more outward channels of the nostrils having no communication, except with the eyes, in receiving the tears through a pipe on each side drilled in the bone. The surface of the nasal passages, and of course the space over which the sound of the voice travels, is much increased, also, by the spiral turns or folds of several shell-like bones, hollow, and spongy within, convex without,

and every where covered by a membrane similar to that in other parts of the nostrils. In hounds, and other acute-smelling animals, these are more numerous than in man, and are beautifully formed into spirals.

The nasal passages are separated from the mouth by a thick, fleshy, and glandular skin or membrane, which is partly stretched, and partly hangs down at the back part of the mouth. To this curtain is hung a little weight, which may be seen on opening the mouth pretty widely. It seems to be designed to guard the fauces, and make the curtain hang steady.

The whole of the nasal passages, with their cells and communicating hollows, are lined with a delicate skin or membrane—called the Schneiderian membrane, from Schneider, a German, who was the first to describe it accurately. It is a pulpy, soft substance, full of pores and small vessels, with which the nerves of smell are minutely interwoven. It adheres every where firmly to the bone, not being covered so thickly with skin as the mouth and other parts; and the blood-vessels being usually full of blood, and much exposed, it is very liable to be affected with cold, and to become swelled and inflamed.

M. Magendie is of opinion, that whenever the sound of the voice traverses those nasal passages,

the tone will be disagreeable, or, as it is commonly called, nasal ; and accordingly he says, that persons who think that the nasal cavities can augment the intensity of vocal sound, by resounding through them, deceive themselves, as this cavity can only produce the reverse effect ; for whenever from any cause the sound is introduced into them, the voice becomes dull and nasal. Blumenbach seems to be of the same opinion ; but, even at the hazard of opposing such high authorities, we beg to give our reasons for being of a contrary opinion. A simple experiment, we think, will settle the difference. If you attempt to speak while you stop your nostrils, the sound of the voice will have more of the character of what is called *nasal*, than if the nostrils were free ; which proves, we think, beyond a doubt, that a portion of the sound of the voice usually traverses the nasal passages, and passes out at the nostrils. The clearer therefore these passages are, the more distinct and free will be the sound of the voice. When they are obstructed or closed by a cold, therefore, or from the bad habit of taking snuff, the clear tones of the voice are always impaired and deteriorated, as we shall see at greater length as we proceed.

THE MOUTH.

The arched form of the roof of the mouth is evidently adapted for increasing the sound of the voice, and accordingly we find, that when it is wanting, as it sometimes is at birth, the voice and speech are greatly injured. The volume, positions, and movements of the tongue, are no less worthy of our observation ; for though it is chiefly useful in articulating, it has also a powerful influence on the sound, by contracting or enlarging the cavity of the mouth.

The teeth, from their very hard and sonorous substance, are also well adapted for increasing the volume of the sound ; and nothing, therefore, tends more to hurt the voice than the loss of the teeth. In old age, when the teeth are all gone, and the jaw projects, the voice is by this means, as well as by changes in the larynx and vocal chords, very much enfeebled.

II.

MECHANISM OF THE VOICE.

SUCH different views have been taken of the mechanism of the human voice, that it is by no means easy to reconcile them. Galen, the famous Greek physician, compared it to a flute, supposing it to be wholly of the nature of a wind instrument ; and in modern times Dodart has advocated the same opinion. Ferrein and others, on the contrary, have compared it to a violin, the vocal chords being in this instance supposed to perform the office of strings. Kratzenstein thought it was like a drum with its head divided ; and Blumenbach compares it to an Eolian harp, — a stringed instrument played upon by the wind. M. Magendie refers us to those instruments whose sound is produced by a reed, such as the hautboy, pipe, and clarionet. It will be necessary, however, for M. Magendie's comparison, ingenious as it is, to observe that the various tones of the voice are produced, not by stopping the holes at different distances, as in those reed instruments, but in varying the width of the windpipe at its orifice or outgoing, where the prin-

cial organs of the voice are situated, and also the length of the tube of the windpipe.

M. Richerand puts the question, however, whether this be really so, and goes into a learned argument to prove that the voice is both a wind and a stringed instrument at the same time. It is very true, he says, that the voice becomes stronger, fuller, and passes from the acute to the grave, as the glottis enlarges with the progress of age ; that it remains always weaker and sharper in a woman, whose glottis is nearly a third smaller than a man's; but the tension or relaxation of the vocal chords may, perhaps, enable them to execute in a given time, vibrations more or less rapid, in such a manner that if the air, expelled from the lungs in breathing, strike upon them in a state of tension, produced by the action of the muscles, which carry back the arytenoid cartilages, to which the vocal chords are attached, whilst the thyroid cartilage, to which are attached the other extremities of the chords, is carried forward by a sort of tilting, occasioned by the muscles connecting it with the cricoid cartilage—the voice will be shrill, clear, and piercing ;—whereas it would be grave, if the arytenoid cartilages were brought forward by the action of their muscles, and the vocal chords relaxed.

It has been objected to the explanation given by M. Ferrien, comparing the voice to a violin, that

to perform the office of vibrating strings, the vocal chords are neither dry, nor tense, nor insulated,—the three-fold condition required for the production of sound in stringed instruments; but notwithstanding the incompleteness of their resemblance to strings, the vocal chords, similar to the vibrating bodies, serving as mouth-pieces to wind instruments, such as the reed of the oboe, the mouth-hole of flutes, the lips themselves in the horn, do not the less contribute to the formation and varied inflexions of the vocal sound.

It is the more difficult to set aside altogether the influence of the vocal chords, inasmuch as their state of tension coincides always with the contraction of the glottis; and the two conditions producing the same effect, it is difficult to determine if it be due to one rather than the other, as it is impossible to decide whether it be to the enlargement of the opening, or the relaxation of the vocal chords, that the grave tones are owing. Besides, another strong reason for considering the larynx as serving at once the purpose of a wind and a stringed instrument, is, that by tying or cutting the nerves of its muscles, the voice is destroyed; so that there is evidently required some kind of action in the sides of the opening.

In speaking in a low tone, we make either a very slight contraction, or none at all, in the muscles

of the larynx, whose action is entirely under the direction of the will. The column of air, then meeting, in the passage along the glottis, only with parts relaxed and little capable of vibration, the vocal sound is no longer produced, but the air, modified by the organs of articulation, forms a whisper.—The permanent extinction of the voice must depend in most cases on the palsy of the vocal muscles.

It appears, then, from this reasoning of M. Richerand, that, rejecting the opposite and exclusive explanations of Ferrein and Dodart, we are to consider the larynx as an instrument combining the advantages, and exhibiting the double mechanism, of wind and stringed instruments: it is on this account that it surpasses all musical instruments, by the extent, the perfection, and, above all, the inexhaustible variety of its effects. There is no one who has heard, at a concert, a solo on the French horn, by an able performer, but has been struck with the resemblance of the tones of this instrument and those of the human voice. It is because the vibrating body at the mouth-piece of the instrument is alive;—it is because the lips, like the sides of the glottis, are moveable, the opening of the mouth dilates and contracts, and, at the same time, its edges are relaxed or stiffened by the contraction of the muscles of the lips.

From the trials which have been made after death, it may be inferred that it is the lower ligaments of the glottis, that is, the vocal chords, which, by vibrating, produce the sound. If we take the windpipe and larynx of an animal or man, and blow strongly into the former, towards the latter, no sound will be produced, but a slight noise resulting from the friction of the air against the walls of the larynx. If, continuing to blow, we bring together the arytenoid cartilages, so that their internal surfaces are in contact, there will be produced a sound which has some resemblance to the voice of the animal from which the larynx was taken. The sound will be more or less acute or grave, according as the cartilages approach each other with more or less force; it will be more intense when we blow into the windpipe with most force.

The same principle is proved by the following facts.—If an opening be made into the windpipe in man or in animals, below the larynx, the voice is destroyed; but will be restored if the opening be stopped mechanically. M. Magendie informs us, that he knows a man who has been in this situation for many years; he can only speak when his cravat, which closes a fistulous opening in the larynx, is drawn tight. The voice is equally destroyed when the larynx is opened below the vocal chords. If, on the contrary, a wound exist above

the glottis, affecting the valve and its muscles, the upper ligaments of the glottis, or even the superior part of the arytenoid cartilages, the voice will still remain. When the glottis, indeed, of a living animal is laid bare, when it cries out it is easy to perceive that the voice is performed by the vibration of the vocal chords. From this fact it appears to be placed beyond a doubt, that the voice is produced in the glottis by the vibrations of its lower ligaments. Now, if this be considered as well established, can we, it may be asked, account for the formation of the voice on philosophical principles? The following is M. Magendie's explanation:—

The air, forced from the lungs, passes at first into a large canal, which soon contracts, and it is then compelled to pass through a narrow passage or chink, the sides of which are two vibrating plates, which, like the plates in reeded instruments, transmit and intercept alternately the passage of the air, and cause, at the same time, sonorous undulations in the current of air which is transmitted. But why, then, it may be asked, when we blow strongly into the human windpipe after death, is there no sound produced analogous to the human voice? Why, also, is the palsy of the principal muscle of this organ always followed by the loss of the voice? and why is an act of the will required for the formation of vocal sounds? The answer is

easy : the vocal chords do not acquire the power of vibrating, like the plates in reeded instruments, except when the muscles are contracted; and consequently, in all those instances where this is not the case, no voice will be produced.

Experiments upon animals confirm this doctrine. For example—if the nerves, as we have already stated, which go to the vocal chords, be cut across, the voice will be lost. Cut but one of the nerves, and the voice is only half lost. It is but right to mention, however, that when animals have felt very severe pain, they have occasionally uttered very sharp cries after both nerves were cut. These cries, however, are extremely analogous to the sounds produced with the larynx of the animal after death, by blowing into the windpipe, and at the same time approximating the arytenoid cartilages,—a phenomenon readily explained by the distribution of the nerves of the larynx.

COMPARATIVE VIEW OF THE VOICE IN QUADRUPEDS AND BIRDS.

Those animals only that possess lungs, possess a larynx; and hence none but the three first classes in the Linnean system have any voice. Even among these, however, some are entirely dumb, as the ant-eater, the pangolin, and the tribes of tortoises, lizards, and serpents. Others lose their

voice in particular regions, as the dog is said to do in some parts of America, and the West Indies, and quails and frogs in various districts of Siberia. It is, indeed, from the greater or less degree of perfection with which the larynx is formed in the classes of animals that possess it, that the voice is rendered more or less perfect; and it is by the introduction of superadded membranes or muscles into its general structure, or a variation in the shape, position, or elasticity of those that are most common to it, that quadrupeds and other animals are capable of making those peculiar sounds, by which their different kinds are respectively characterized; and are able to neigh, bray, bark, or roar; to purr, as the cat and tiger kind; to bleat, as the sheep; or to croak, as the frog. The frog, however, has a sack or bag of a singular character in the throat or cheek, directly communicating with the larynx, on which the croaking principally depends.

In birds, the larynx is of a very peculiar construction, and admirably adapted to that sweet and varied music with which we are so often delighted in the woodlands. The whole extent, indeed, of the windpipe in birds, may be regarded as one vocal apparatus; for the larynx is divided into two sections, or may rather, perhaps, be considered as two distinct organs. That which is the more

complicated, or in which the parts are more numerous and elaborate, is placed at the lower end of the windpipe, at the place where it divides, in order to be distributed through the lungs: the more simple, or that in which the parts are fewer, and consisting of those not included in the former, occupies its usual situation at the upper end of the windpipe, which is, however, destitute of the valve or epiglottis. From this view of the vocal organs in birds, we may consider their lungs, windpipe, and larynx, as forming a natural bagpipe, in which the lungs constitute the pouch, and supply the wind; the windpipe itself forming the chanter or pipe; the lower, or more complicated glottis, being the reed or mouth-piece which produces the simple sound; and the upper glottis, the finger-holes which modify the simple sound into an infinite variety of distinct notes.

It must be confessed, however, that in birds we meet with a considerable diversity in the structure of the vocal organs, particularly in the length and thickness of the tube of the windpipe; and that not only in different species, but often in different sexes of the same species, and especially among water-fowl. For example, in the tame or dumb swan of both sexes, the windpipe is straight; whilst in the male of the musical swan, though not in the female, it winds into a large convolution

contained in the hollow of the breast-bone. The males, also, of the duck and merganser, have at the lower glottis an additional bone to the cavity, which is supposed to assist in strengthening their voice; but in the females this is wanting.

The celebrated John Hunter, at the request of Mr. Pennant, dissected the larynx of many singing birds, and found that the loudest songsters have the strongest muscles. The sky-lark, whose clear and vigorous note is often heard when he can no longer be followed in his ascent by the most penetrating eye, was found to have these muscles the strongest. Mr. Hunter also observed, that, among singing birds, the muscles of the male, following the same rule, are stronger than those of its respective female, whose voice also is always less powerful. It was very remarkable, likewise, that he could discover no difference in the larynx of the male and female, in birds which do not sing.

In consequence of the more complicated and extensive apparatus of organs in the vocal organs of birds which we have just described, we find a numerous tribe possessing very extraordinary powers. In many of them, such as the thrush and the nightingale, the natural song is exquisitely varied through an astonishing length of scale. In the tuneful manikin, the song is not only intrin-

sically sweet, but forms a complete octave, one note succeeding another, in ascending and measured intervals, through the whole range of its musical scale. Some species of birds are capable of imitating the music of human art, and amuse us by acquiring and executing national and popular tunes—such, for example, as the bullfinch, the linnet, and even the robin, when reared in a state of separation from other birds. Others, again, are capable of imitating human speech—as the parrot, the jay, and the jackdaw,—a fact which proves the possession of a powerful and retentive memory, as well as of a precise and delicate ear. A linnet, according to Mr. Pennant, was once taught the same at Kensington; and even the nightingale is said to have talents for speaking equal to those for singing. But where is the man whose bosom burns with a single spark of the love of nature, who could for a moment consent that this sweet songster of the groves should barter away the touching wildness of its native notes for any thing that art has to bestow? Yet, perhaps, there is no species among the class of birds, that is more entitled to notice, in this point of view, than the American mocking-bird, which is a species of thrush. Its own note is delightfully musical and solemn; but, beyond this, it possesses an instinctive talent of imitating the note of every other kind of singing-bird, and even

the voice of every bird of prey, so exactly as to deceive the very kinds it attempts to mock.

It must be manifest, from the preceding observations, that the imitative, like the natural voice, has its seat in the cartilages, and other moveable pieces, which form the larynx ; for the great body of the windpipe only gives measure to the sound, and renders it more or less copious in proportion to its volume. It is not, therefore, to be wondered at, that a similar sort of imitative power should be sometimes cultivated with success in the human larynx ; and that we should occasionally meet with persons, who, from long and dexterous practice, are able to copy the notes of almost all the singing-birds of the woods, or the sounds of other animals, and even to personate the different voices of orators and other public speakers. This leads us to notice a very singular and mysterious subject of investigation—

VENTRILOQUISM.

Several ingenious explanations have been given of this art of imitation, though none, hitherto published, are altogether satisfactory. The term is derived from the origin of the imitative voice being supposed to be in the stomach or belly. We shall put our readers in possession of the best accounts of this singular faculty which we have met with.

M. RICHERAND'S ACCOUNT OF FITZ-JAMES.

“There was,” says Richerand, “at the Café de la Grotte, in the Palais Royal, a man who could carry on a dialogue so naturally, that you would think you were listening to the conversation of two people, at some distance from one another, and quite different in voice and tone. I have observed that he was not inspiring when he spoke from his belly, but that less air came from his mouth and nostrils than in his ordinary speaking. Every time that he did so, he found a swelling in the region of the stomach; sometimes he felt wind moving lower down, and could not go on long together without fatigue.

“At first, I conjectured that in this man a great part of the air driven out by expiration did not issue from the mouth and the nasal passages, but that, being swallowed and carried down into the stomach, it struck against some part of the intestines, and produced a real echo: but having since observed, with the greatest care, this curious phenomenon in M. Fitz-James, who exhibits it in the highest perfection, I have satisfied myself that the name of *ventriloquism* no way suits it, since its whole mechanism consists in a slow, gradual, attenuated expiration, whether for that purpose the artist employ the power of the will upon the

muscles of the sides of the chest, or whether he hold the epiglottis slightly lowered, by means of the root of the tongue, of which he scarcely brings the point beyond the dental arches.

“ This long expiration I always found to be preceded by a strong inspiration ; and by this means he introduced into his lungs a large quantity of air, of which he afterwards husbanded the use. The repletion of the stomach accordingly was a great hindrance to the performance of M. Fitz-James, by preventing the descent of the midriff or diaphragm, which the chest would require, to dilate itself for the full quantity of air the lungs should receive. By accelerating or retarding the expiration, he could imitate different voices ; made it seem that the speakers in a dialogue, which he carried on by himself, stood at different distances ; and produced a complete illusion. No one could surpass M. Fitz-James in the art of deceiving, in this respect, the most wary and suspicious observer. He could set his organ to five or six different tones, pass rapidly from one to the other, as he did when he represented a very eager discussion in a popular society of the people, imitated the sound of a bell, and carried on singly a conversation in which one might think that several persons of different ages and sexes were taking parts. But what completed the illusion, and especially distinguished the art of

the ventriloquist from that of the mimic, who can only counterfeit, consisted in the power of so modulating his voice, that one was deceived as to the distance of the speaker, in such sort that one voice came from the street, another from a neighbouring apartment, and a third from one who appeared to have clambered up to the roof of the house. It is easy," says Richerand, "to discern the value of such a talent in the days of the oracles."

THEORY OF MR. GOUGH.

Whether a sound be before or behind the ear, seems to be determined as much by the affection produced in the face and head, as on the ear itself; for that we *feel* sound on our face and other parts, is highly probable from the ingenious experiments of Mr. Gough. The ticking of a watch placed between the teeth, for example, is distinctly heard by the sound vibrating through the bones of the face and head. It is quite certain that the sound of the voice comes through the bones of the head, as well as through the mouth and the nasal passages; for when a person calls out of a room with his mouth, through a hole in the closed door, those within hear his voice, but it has a strange muffled sound, as if part of its volume were intercepted. Now this sound, Mr. Gough thinks, could not come directly from the mouth when *it* is without the

room. But may it not, we would ask, be transmitted through the door? Surely wood is not impermeable to sound: nay, is it not a better conductor of sound than bones covered with soft muscles?

According to similar principles, Mr. Gough describes what is called ventriloquism, to be an acquired method of intercepting the direct sound of the performer's voice, and causing only its echo to be perceived. Every body, of course, if this be the case, could be a ventriloquist, if he could in this manner intercept his direct voice. By very careful attention, we may easily recognise the *echo* of our own voice, as distinct from its direct sound when uttered in a room or other confined place, though this reflected sound is seldom attended to, because it is drowned by the direct one being much louder. The reflected sound, however, is always produced.

Mr. Gough's explanation, however, will not account for the perfect quiescence of the mouth and cheeks of the performer, while employing his feigned voices; besides, an adept in the art, like Fitz-James, or like the present M. Alexandre, is totally indifferent to the room in which he practises, and will readily allow another to choose a room for him. It will apply only to performances like those of Mathews, who, it may be

remarked, while attempting ventriloquism, seldom uses words in which labial letters occur, lest, we presume, the audience should see his lips move. When he cannot avoid such words, he always dexterously conceals his mouth from the audience; the feigned voice, in this case, is also so modified as to remove the raciness which might indicate that it had a near origin. We say *feigned* voice, for the performance seems to have much of the same character as falsetto singing: Mathews accordingly, it may be remarked, seldom or never attempts a continued conversation; but confines himself to exclamations, and short questions and answers, very much in the manner of the exhibitions of puppet-shows. This, however, will not apply at all to M. Alexandre, who can imitate the frying of an omelette, the calls of a chimney-sweeper's boy seeming to ascend the chimney, &c.

BARON DE MNGEN'S ACCOUNT OF HIS OWN
VENTRILLOQUISM.

In 1770, the Baron de Mengen, a Colonel in the Austrian Service, who was a ventriloquist, gave the following explanation of his method of performing:—He pressed, as he said, his tongue strongly against his teeth and his left cheek, circumscribing in this way a cavity containing a volume of air, which for this purpose was kept in reserve in the throat, to

modify the sound of the voice, and make it appear as if it came from a distance. It was of importance, he said, to manage the air taken in by inspiration, and to respire only with the most guarded economy. We confess, that this explanation is to us very far from being satisfactory ; for though it cannot be denied that the cavity of the mouth has a great influence on the sounds of the voice, yet we cannot conceive this circumscribed cavity of De Mengén's as any thing better than a German story.

M. LESPAGNOL'S THEORY.

In 1811, M. Lespagnol, a young physician, sustained a thesis before the Faculty of Medicine at Paris, on the subject of ventriloquism. According to him, the whole depends on the action of the membranous curtain between the mouth and the nasal passages, as described above, page 21. In the ordinary voice, he says that one part of the sound passes directly through the mouth, and another through the nasal passages and the nose ; so that, to one who is near a speaker, the two sounds strike the ear at the same time ; but to one who is at some distance, the sound from the mouth only is heard, and in that case, the voice appears more feeble, and the tone in particular is so different, that we judge chiefly by this of the distance of a sound. The difference, therefore, says M. Lespagnol, between

the near and the distant sound of the voice is, that in the first case, there is a compound of two sounds, while in the second, only that through the mouth is distinguished.

The secret, then, of the ventriloquist, according to these principles, consists in either preventing the nasal sound from being produced or from being heard, which is easily effected by elevating the membranous curtain, or *veil of the palate*,* as anatomists call it. When this is effected, the vocal sound cannot go into the nasal passages; only the direct sound through the mouth is produced, and from its consequent feebleness and shrillness of tone, it is judged to come from a distance. When the sound appears to come from a certain place, it is because the performer finds means to direct attention thither; but the voice of itself ought only to have the character of having come from a distance, and that more or less, according as it is more or less prevented, by the membranous curtain, from entering the nasal passages. The performer causes his voice to appear near, or at a distance, at his pleasure, by this management of the veil of the palate. As to the common opinion, that the ventriloquist performs with his mouth shut, M. Lespagnol says it is incorrect; for he articulates, though very

* Velum pendulum palati.

slightly (*petitement*), and the sound is small and thin.

The above explanation is the more deserving of attention, that M. Lespagnol was himself a ventriloquist, and could the better describe in what manner he operated. But we think it very doubtful whether he was not himself deceived by his feelings; as it is by no means easy to identify to the mind the internal parts which are in action, while they cannot be externally felt or observed, as must be the case with this delicate management of the veil of the palate.

M. Comte, also a ventriloquist of some celebrity, said that his voice was formed in the ordinary manner in the larynx, but was afterwards modified by the play of the other parts of the vocal apparatus; and by inspiration it is directed into the chest, where it resounds: but to obtain this effect, both force and flexibility of the organ are indispensable. This, however, is too complicated an explanation to be readily understood, and we are far from thinking it near the truth.

M. MAGENDIE'S THEORY.

Man, says M. Magendie, possesses the power of varying indefinitely the appreciable and inappreciable sounds of his voice, and can change at pleasure, in a thousand ways, its intensity and note.

Nothing, therefore, can be easier, than to imitate exactly the different sounds which strike upon his ear; this, indeed, he executes under a variety of circumstances.

It is very common for many persons to imitate perfectly the voice and pronunciation of others. Hunters imitate the different cries of their game, and succeed by these means in attracting them into their snares. The faculty which some persons possess, of imitating different sounds, has been made a profession of by some individuals, who have been supposed to have received from nature an organization different from other men. But this is a mistake; they only possess the organs of speech and voice, well arranged, so that they can readily execute the sounds which they wish to produce.

The principles upon which this art rests, are easy to comprehend. We know, from experience, that sounds are altered by a variety of circumstances; for example, they become weakened, less distinct, and change their tone, when they are at a distance from us. When a man descends into a well, and speaks to those who are above him, his voice does not arrive at their ears until it has undergone several modifications, arising from distance, and the form of the canal which it has passed through. If, then, a person have carefully marked these modifications, and exerts himself to imitate them, after

a little practice, he will be able to produce this acoustic illusion : and we can no more avoid being deceived by it, than we can prevent our seeing objects larger than they actually are, when we examine them through a magnifying glass. The deception will be complete, if he employ other illusions to distract the attention.

The better the talents of the artist, the more perfect and numerous the illusions will be ; but we must guard ourselves from supposing that the ventriloquist produces voice and articulate sounds differently from other persons. His voice is formed in the common manner, but it is modified by the artist in its volume and tone. As relates to his pronouncing words without moving his lips, it is because he employs words in which there are no labial letters. In one respect, we may say that this art is to the ear what painting is to the eye. The term ventriloquism, however, which was applied to the art in the infancy of science, ought no longer to be admitted.

We may remark, that M. Magendie's description of the performance is not quite accurate, and his view of an ordinary articulation and formation of the voice is at variance with that perfect quiescence of the muscles of the cheeks and lips, which the more skilful ventriloquists evince, and which can only be accounted for by a formation of arti-

culations, and not merely a modification of sounds in the larynx.

THEORY OF DR. MASON GOOD.

The first impression, says Dr. Good, which this ingenious trick or exhibition produced on the world, was that of the artist's possessing a double or triple larynx,—the additional larynxes being supposed to be seated still deeper in the chest than the lowermost of the two that belong to birds, whence indeed the name of ventriloquism, or *belly-speaking*. From various concurring facts, ventriloquism appears to be an imitative art, founded on a close attention to the almost infinite variety of tones, articulations, and inflexions, which the glottis is capable of producing in its own region alone, when long and dexterously practised upon; and a skilful modification of these vocal sounds, thus limited to the glottis, into mimic speech, passed for the most part, and whenever necessary, through the cavity of the nostrils instead of through the mouth. It is possible, however, though no opportunity has hitherto occurred of proving the fact by dissection, that those who learn this art with facility, and carry it to perfection, possess some peculiarity in the structure of the glottis, and particularly in respect to its muscles or cartilages.

In singing, every one knows that the glottis is

the only organ made use of, except where the tones are not merely uttered, but articulated. It is the only organ employed, as already observed, in the mock articulations of parrots and other imitative birds ; it is the only organ of natural cries, constituting the language of all animals possessing a voice ; and hence Lord Monboddo has ingeniously conjectured that it is the chief organ of articulate language, in its rudest and most barbarous style. "As all natural cries," says he, "even though modulated by music, are from the throat and larynx, or knot of the throat, with little or no operation of the organs of the mouth, it is natural to suppose that the first languages were, for the greater part, spoken in the throat ; and that what consonants were used to vary the cries, were mostly guttural ; and that the organs of the mouth would at first be but very little employed." To which we may add, that notwithstanding, in the ordinary use of speech, the tongue takes an auxiliary part among mankind, yet the numerous and well-authenticated examples on record, and to which we shall have occasion to advert more minutely hereafter, of persons who have retained a full and perfect command of speech, after the tongue has been destroyed or extirpated, proves incontrovertibly, that the glottis alone is capable of supplying, in this respect, the place of the tongue, upon particular occasions, and when, per-

haps, peculiar pains are taken to call forth the full extent of its latent powers.

Having thus given all the theories which we consider worthy of notice, we must leave the reader to draw his own conclusions. We think, however, that Dr. Good's explanation is by far the most philosophical and plausible.

III.

VARIETIES OF THE VOICE, AND THEIR CAUSES.

No part of our subject is of more importance than this, in a practical point of view; but, unfortunately, no part is more involved in obscurity. As in the previous discussions which we have examined, the French philosophers have taken a distinguished part, so in this we shall find that we are indebted to them for almost all that is known on the subject. We shall not, therefore, spend much time in refuting the older opinions of Fabricius ab Aquapendente and others, but proceed at once to give the results of the inquiries and experiments of MM. Bichat, Cuvier, Dutrochet, Biot, and Magendie; particularly the two last.

The explanations formerly given by distinguished authors of the formation of the varied tones of the voice, ought to be rather looked upon as comparisons than as accounting for the phenomena. They all radically err, in being founded on a consideration of the larynx and glottis in the dead body, while the only true mode of investigating the subject is a minute attention to the structure of the parts, and a careful examination of the phenomena during life. We must apologise for the cruelty of the following experiment, which was made with this view.

M. Magendie laid bare the glottis of a living dog, by making an incision between the hyoid bone and the thyroid cartilage ; and, while it was howling from the pain, carefully examined the action of the parts. When the sounds were grave, he found that the vocal chords vibrated through their whole length, and that the expired air passed out through the whole extent of the glottis. When the sounds were acute, on the other hand, the vocal chords did not vibrate in the front, but only in the back part; and, as the opening of the glottis was of course diminished, the air only passed through that portion of the glottis which vibrated. When the sounds again became very acute, the vocal chords no longer vibrated, except at the very extremity, where they join the arytenoid cartilage,

and the expired air then passed out only at this part of the glottis. So far as he could ascertain, the acuteness of the sound increased until the glottis became entirely closed; when the air could no longer pass through the larynx, and the sound ceased. Now, the principal use of the arytenoid muscle being to close the glottis at the back part, he inferred that it was the chief agent for producing acute sounds. To prove this, he cut the two nerves which supply the muscle, and found, when he had done so, that the animal lost all its acute sounds, and acquired besides an habitual gravity which it had not before possessed.

In man and in the dog, the structure and mechanism of the larynx and vocal chords are so much alike, that we cannot reasonably doubt but the same phenomena take place in both. There is another circumstance which must also have a strong influence on the tones of the voice, namely, the contraction of the muscles which close the front half of the glottis. The more strongly these muscles contract, the more will their elasticity be increased, and the more susceptible they will be of vibrating rapidly, and of producing acute sounds. On the contrary, the less they are contracted, the more grave the sounds will be.

The larynx, then, it would appear from the facts we have detailed, represents a reeded wind instru-

ment with a double plate, the tones of which are more acute as the plates are shortened, and more grave the longer they become. Although this analogy, however, be generally correct, it does not necessarily follow that it is in every part complete. The common reeds of instruments, in fact, are composed of rectangular plates, fixed on one side and free on the other three. In the larynx, on the other hand, the vocal chords or reeds are indeed nearly rectangular, but they are fixed by three sides instead of one. Again, in the common reeded instrument, we raise or lower the notes by varying its length; while, in the plates of the larynx or vocal reeds, it is the size which is varied. In musical instruments, besides, we cannot employ nor procure reeds, the plates of which can every instant alter their thickness and elasticity, as happens in the vocal chords. It can easily be conceived, then, from these circumstances, that the larynx may produce the voice, and vary its tones, somewhat after the manner of reeded instruments, without our undertaking minutely to explain all the particulars in its mode of action.

Previous inquirers, such as Dutrochet and Cuvier, have maintained that the tube which conveys the air to the reed has no influence on the sound produced. M. Birt, however, relates an experiment by M. Grenié, which proves the reverse of

this. It is not impossible, that the lengthening or shortening the windpipe, which is the tube for conveying the air to the larynx, may have some influence in the production of the voice, and on its different tones. This tube, indeed, may be lengthened or shortened, enlarged or diminished in diameter;—being susceptible of assuming an infinite number of different forms, it will fulfil very well the office of the body of a reed instrument; that is, it will possess the power of arranging itself, so as to harmonize with the larynx, and thus favour the production of all the numerous tones of which the voice is susceptible. It will increase the intensity of the vocal sounds by assuming a conical form; by enlarging externally, it will give them an agreeable rotundity; or, by arranging the external opening conveniently, it will nearly suppress them. Until natural philosophy has determined with precision the influence of the tube in reeded instruments, we can, at best, only form probable conjectures respecting the influence of the tube in the formation of the voice. We can only illustrate this by some experiments which relate to those phenomena which are the most apparent.

The larynx is elevated during the production of acute sounds, and depressed when they are grave; consequently, the vocal tube is shortened in the first case, and lengthened in the second. We may

conceive, indeed, that a short tube is most favourable to the transmission of acute sounds, and that a long one is most advantageous in those which are grave. The change is said to be an inch for every octave of the musical scale, but this we will not positively affirm. While the tube changes its length, it alters at the same time its diameter or calibre,—a circumstance which is remarkable, because, as we have seen above, the size of the tube influences its facility of transmitting sound.

When the vocal tube is lengthened by the descent of the larynx, the thyroid cartilage is depressed, and separated from the hyoid bone. By this separation, the epiglottis or valve is drawn upwards, and the vocal tube is in consequence considerably enlarged. The opposite happens when the larynx is elevated. In imitating this movement upon the dead body, we may satisfy ourselves that this contraction may be carried to five-sixths of the size of the tube. Now, we adapt a large tube to a reed which is to form grave sounds, and, on the contrary, a narrow tube to one which is intended to convey acute sounds. We can, then, to a certain extent, account for the changes of size which take place in the vocal tube.

From its form, position, elasticity, and the movements impressed upon it by its muscles, the epiglottis or valve seems to constitute an essential

part of the apparatus of the voice : we have just seen that it assists in the contraction of the vocal tube, but we may suppose that it performs a still more important function. M. Grenié, who has invented so many ingenious and useful modifications of reeded instruments, did not arrive at these results by a single effort, but had to pass through a long series of intermediate inquiries. At one period of his investigations, he wished to augment the intensity of the sound without changing the reed : to effect this, he was obliged to augment, gradually, the intensity of the current of air ; but this, though it rendered the sounds stronger, had likewise the effect of elevating the note. To remedy this inconvenience, M. Grenié could find no other method than to place obliquely in the tube, immediately above the reed, a flexible elastic tongue, resembling very much the epiglottis. We may, therefore, fairly infer from this, that the epiglottis assists in giving to man the power of swelling vocal sounds without elevating the tone.

The greater the force with which air is expelled from the chest, the greater will be the extent of the vibrations of the vocal chords ; and the longer these chords are, that is, the greater the capacity of the larynx, the more considerable will be the extent of the vibrations, and the volume and intensity of the voice. A strong person, whose breast

is large, and in whom the dimensions of the larynx are considerable, presents those circumstances, which are the most favourable to the intensity of the voice. But if this person become sick, and his strength reduced, his voice will lose much of its intensity, for this simple reason, that it can no longer expel the air from the chest with great force. Children, women, and eunuchs, in whom the larynx is proportionally smaller than those in adult men, have also naturally the voice much less intense than his. In the ordinary production of the voice, it results from simultaneous movements on both sides of the glottis. If one of these sides lose the faculty of exciting vibrations in the air, the voice will necessarily lose half its intensity, supposing the expiratory force to remain the same. We may satisfy ourselves on this point, by dividing one of the nerves which go to the side of the glottis, or by examining the voice of a person attacked with complete palsy of one side.

Each individual possesses a peculiarity of voice, by which he is as readily known as by his face, and of course this peculiarity is infinite in its modifications. The precise circumstances on which this depends are far from being well understood; but the female voice, and that of children and eunuchs, is generally found connected with a peculiarly soft state of the cartilages of the larynx. The

masculine note of the voice which is sometimes observed in females, seems, on the contrary, to be connected with a hard and bony state of these cartilages, and particularly the thyroid.

NATURAL AND ACQUIRED VOICE.

The only natural voice is that which is known by the name of a cry, being a sound produced by the larynx, and susceptible of variety, both in tone, intensity, and note. It is easily distinguished from all vocal sounds ; but, as its character depends upon its note, it is impossible to explain the reason of the difference between it and all other vocal sounds. All men who have not entirely lost their voice, are capable of uttering cries,—the new-born infant and the decrepit old man ; the savage and the civilized man ; those who have been dumb from birth, and idiots.

Crying, therefore, depends essentially on the organs, and is employed to express strong feelings, either pleasant or painful. The several wants and passions, however, not being connected with organization, have no peculiar cries. Cries are generally the most intense sounds which the organ is capable of forming, often wound the ear, and act strongly by sympathy on those who hear them: they are a kind of language common to most animals, and nearly the only one which they possess. The voice can be greatly modified by imitation ;

and all such modifications may be justly denominated an acquired voice, which is exceedingly different in character from the natural voice of crying. A deaf child cannot imitate sounds, and therefore can never possess this acquired voice. Since, therefore, the voice is the result of hearing, and of an intellectual effort, it cannot be developed, unless both these conditions exist. Children who are deaf from birth cannot form any idea of sound; and idiots are not capable of establishing any relation between the sounds which they hear and those which they are capable of producing, and of course can have no voice,—although in both the vocal apparatus may be fitted to form and modify sounds, as well as in those individuals whose conformation is the most perfect. For the same reason, those individuals (such as Peter the wild man) who have been improperly called savages, from their having wandered alone in a forest from their infancy, do not possess voice, because, in this insulated and solitary state the understanding does not sufficiently develop itself, from want of necessity for mental exertion.

CHANGES OF THE VOICE ACCORDING TO AGE.

Before birth, and in the new-born infant, the larynx, compared with the adjacent parts, is proportionally very small. The cartilages are also

flexible, and are far from possessing the consistence which they afterwards acquire. The larynx preserves these characters until about the period of puberty; at this time, a general revolution takes place in the animal economy. The rapid increase of nutrition causes very considerable changes, and particularly in the organs of the voice. The great increase in the nutritive powers is first apparent in the muscles; afterwards, but more slowly, it is manifested in the cartilages, when the general form of the larynx becomes modified. The thyroid cartilage is developed in front, but much more strongly in the male than in the female; from which circumstance the vocal chords are considerably lengthened, and this is more worthy of remark than the general enlargement of the glottis, which takes place at the same time.

We may remark, that in the change which takes place at puberty, every part that is changed does not always harmonize with the rest: some parts become more tense, others less and yield more easily; some are more relaxed, others more contracted. We may judge of the effect that may be produced by such changes, from the remark of M. Dodart, that a variation in the capacity of the glottis, not exceeding the fifty-fourth part of a silk-worm's thread, or one three hundred and fifty-fourth part of a hair, will occasion a difference of

tone. Time, however, and the exercises which we shall afterwards point out, will usually triumph over these discrepancies, wherever they exist, in a few months.

At this period, the male voice sometimes acquires in a few days, and sometimes more suddenly, a grave note essentially different from what it exhibited before, and generally falls an octave or a fifth. In some cases the voice is nearly lost, and does not entirely return for some weeks. Frequently there remains, for a time, a remarkable hoarseness; and young men often form very acute sounds when they intend to produce grave ones, from the voice being dissonant, and untrue to itself, and irregularly alternating from harsh to shrill. This state of things continues frequently for a year, after which the voice gets its natural note, which continues through life: though we sometimes meet with individuals, who at this time lose for ever the faculty of singing; and others, whose voices before this period were rich and extensive, afterwards become indifferent and limited.

The gravity which the voice acquires depends evidently on the developement of the larynx, and especially on the lengthening of the vocal chords. As these parts cannot extend backwards, they are lengthened in front; and this causes the prominence

called Adam's apple, which does not exist in boyhood, nor in females: and hence the reason why the voice of males is graver and deeper. The deepest tones, indeed, are struck by animals which have the largest glottis, such as the ox, and the bittern; while singing birds, which sound the acutest tones, have a glottis capable of the closest contraction. The deepest roarings are produced by animals that have the cartilages of the windpipe entire, or imbricated, or tessellated with bones, as the lion, the elephant, &c.

After the age of puberty, the larynx undergoes no other very remarkable change; except that its volume somewhat increases, and the projection in front, or Adam's apple, becomes rather larger. In man, the cartilages are partially converted into bone. In old age, this process continues, and at last becomes nearly complete, while the vocal chords diminish in size, become less deep-coloured, lose their elasticity, and at last undergo modifications similar to those of the rest of the muscular system. The voice maintains the character it acquires at puberty till the approach of old age; at least its modifications during this interval are inconsiderable, and chiefly respect its note and volume: but as old age approaches, the voice becomes essentially altered; its note is changed, and its extent diminished. Singing is more difficult—the sounds

resembling cries, and being produced with difficulty and labour. The organs of pronunciation are altered—the teeth being shorter and often lost.

All these phenomena become more remarkable as old age advances,—the voice becoming weak, tremulous, and broken. The same remarks apply to singing; the defects in both cases arising from the imperfect contraction of the muscles, the slowness in the movements of the tongue, the loss of the teeth, and the proportionably increased length of the lips.

QUALITIES AND DEFECTS OF THE VOICE.

It is extremely difficult to distinguish the different shades of voice in precise language, on account of the vagueness of the terms which we are obliged to employ. To say that a particular voice is loud or soft, full or thin, sweet or brilliant, or rich, smooth, or harsh, will all be understood in different senses by different individuals, according to their associations, taste, and delicacy of ear. As the voice, also, from not nearly resembling any instrument either in tone or variety, and as no two voices are exactly alike, there is no proper standard by which to judge of its excellences. We must be contented therefore with the terms, vague as they are, which have been employed to designate the different qualities and defects of the voice.

The ancient orators divided the nature of the tones into quantity and quality thus :

QUANTITY OF THE VOICE.

The body or volume.	Smallness or feebleness.
The compass.	The narrow scale.
The soundness and durability.	Weakness, liable to fail.

QUALITY OF THE VOICE.

Clearness.	Indistinctness.
Sweetness.	Harshness.
Evenness.	Broken, or cracked.
Variety.	Monotony.
Flexibility.	Rigidity.

An old author, Julius Pollux, in his curious work entitled *Onomasticon*, has given many more distinctions which we think it may be useful to enumerate.

EXCELLENCIES OF THE VOICE.

High.	Persuasive.
Powerful.	Engaging.
Clear.	Tractable.
Extensive.	Flexible.
Deep.	Executive.
Brilliant.	Sweet.
Pure.	Sonorous.

Soft.	Harmonious.
Attractive.	Distinct.
Melodious.	Perspicuous.
Cultivated.	Articulate.

DEFICIENCIES AND BAD QUALITIES OF THE VOICE.

Obscure.	Unattractive.
Husky.	Unmanagable.
Unpleasing.	Uninteresting.
Small.	Rigid.
Feeble.	Harsh.
Thin.	Cracked.
Faint.	Doleful.
Hollow.	Unsound.
Indistinct.	Hoarse.
Confused.	Brassy.
Discordant.	Shrill.
Unharmonious.	Squeaking.

THE SINGING VOICE.

The varieties of the voice which we have just sketched belong more peculiarly to speaking than to singing; but in the latter the differences are not less numerous, and perhaps even more important. It will be sufficient, however, for our purpose, to keep to the three great divisions of treble, tenor, and bass, commonly recognised. Indeed, we may consider them, without impropriety,

under the two great divisions of grave and acute, in general having a difference of about one octave. Men have commonly grave voices; but those whose voice is the most grave may form acute sounds, by taking what is called the *falsetto*. By adding all the notes of an acute to those of a grave voice, the extent will be nearly three octaves; but it does not appear that any singer has ever possessed a voice of this compass in which the sounds were clear and agreeable. The differences which exist between different voices do not altogether regard their compass. There are strong voices, the sounds of which are loud and noisy; soft voices, with sweet mellow notes like those of a flute; fine voices, the sounds of which are full and harmonious; and just, false, flexible, light, hard, and heavy voices. Many singers have their good sounds irregularly distributed,—some in their bass, some in their treble, and others between. In a common voice there are about nine notes between its highest and its lowest tones; the most extensive voice does not much exceed two octaves in full and well-formed sounds.

The Italians, who are great masters of singing, distinguish two principal qualities of the voice: the *voce di petto*, or natural voice, formed as the term implies in the breast, and terminating generally in a male *soprano* at D or E, in a *contralto* at G, A

or B ; and the *voce di testa*, or artificial voice, modified by the head, and going up to the highest compass of the voice. The latter is usually termed the *falsetto*, and is employed to continue the higher notes of the scale where the natural voice ceases. It is common with all singers, but of course its powers and qualities are infinitely varied in different individuals.

In male singers, its tone and character are unfortunately for the most part so distinct from those of their *voce di petto*, that they cannot make the one flow harmoniously into union with the other ; and on this account the equality of the voice is much injured, from the *falsetto* appearing, as it were, to be the voice of another individual. It hence becomes one of the great triumphs of art, particularly in tenors, to unite and assimilate those two voices in the notes where they join ; but complete success in this is very rarely, if ever, attained. When the *voce di testa* is pure, brilliant, and sweet, divested of every nasal character, and powerful in volume, it is the finest quality the male voice can possess ; and it was this which led to the employment of eunuchs as singers,—a practice which for a time was so disgraceful to the Italian opera. Braham has more natural character in his *voce di testa* than perhaps any of our present singers ; but even in him, the deception of sameness does not accom-

pany him through any considerable compass, and, by a practiced ear, is soon recognised. We should say, that in all these varieties it is the brilliancy of the tone which is most certainly productive of the greatest effect, and, to arrive at the ready execution of this, ought to be the chief aim of every singer. The heavy tones of the bass, it has been justly remarked, are for the most part very dead, and produce less musical pleasure than any other; and hence Bartleman seems to have owed his reputation to the brilliancy he threw into such notes, by lightening the tone of his voice, and by assuming an energetic manner. The scale of pleasure may be said to increase with the altitude of the tone from the bass to the tenor, the counter-tenor, and the treble or female voice, which, when it is of a fine rich tone, and of a sufficient volume, has decidedly more power over the feelings than any other character of voice.

With respect to volume, or force of the voice, the Italians distinguish three gradations, the *piano*, *messa di voce*, and *forte*; the management of which is of great importance, as we shall afterwards show in our practical instructions.

THE AIR, OR STYLE OF SINGING.

We should consider our remarks on the varieties of the voice to be very incomplete, were we to omit the division which the Italian singers have made of their different airs employed in opera singing : such as the *Aria Cantabile*, *Parlante*, *di Bravura*, &c., which we shall now characterise in their order, from the able work of Mr. Brown on the structure of the Italian Opera.

ARIA CANTABILE.

The *Aria Cantabile*, is by pre-eminence so called, as if it alone were song ; and indeed, it is the only sort of song which gives the singer an opportunity of displaying at once, and in the highest degree, all his powers, of whatever description they be. The proper objects for this air are sentiments of tenderness. Though this be an expression which always leads the mind to sadness, yet the sadness is of that pleasing kind which the mind loves to indulge. Hence it arises, that the *Aria Cantabile*, whilst it is susceptible of great pathos, admits, without prejudice to the expression, of being highly ornamented, for this plain reason,—that though the sentiments it expresses are affecting, they are at the same time such as the mind dwells on with pleasure ; and, it is likewise for this reason, that the subject of the

Cantabile must never border on deep distress, nor approach to violent agitations ; both of which are evidently inconsistent with ornament. The motion of this air, though not so solemn as that which belongs to still graver subjects, is very slow, and its constituent notes of consequence proportionally long ; we say constituent notes, in order to distinguish those which the singer introduces as ornamental from those which constitute the melody itself. These last are in general very few, extremely simple in their march, and so arranged as to allow great latitude to the skill of the singer. The instrumental parts are, in this kind of song, restricted to almost nothing ; for the accompaniment is of use to the singer, because it supports the voice, yet it ought to be kept so subordinate to the vocal parts, as never during the song to become the object of attention. In listening to an air of this description, though the mind is all awake to feeling, yet are the emotions it experiences of that gentle kind which unfit it neither for the contemplations of beauty, nor the admiration of the art ; on the contrary, they serve to dispose more effectually for both. Thus may many of the noblest faculties of the mind be gratified at once : we judge, we feel, we admire, at the same instant of time.

ARIA DI PORTAMENTO.

The *Aria di Portamento* is a denomination expressive of the carriage of the voice. This kind of air is chiefly composed of long notes, such as the singer can dwell on, and have thereby a greater opportunity of more effectually displaying the beauties and calling forth the powers of his voice; for the beauty of sound itself, and of the voice in particular, as being the finest of sounds, is held by the Italians to be one of the chief sources of the pleasure we derive from music. The subjects proper for this air are sentiments of dignity, but calm and undisturbed by passion. The subject of the *Aria di Portamento* is of a nature too serious and important to admit of that degree of ornament which is essential to the *Cantabile*. To illustrate the specific difference of these two classes, we might say, that were Venus to sing, her mode of song would be the *Cantabile*; the *Portamento* would be that of the Queen of gods and men.

ARIA DI MEZZA CARATTERE.

The *Aria di Mezza Carattere* is a species of air which, though expressive neither of the dignity of the latter, nor of the pathos of the former, is, however, serious and pleasing. There may be an almost infinite variety of sentiments, very pretty and very interesting, which are not, nevertheless, of sufficient

importance to be made the subject either of the *Cantabile* or the *Portamento*: the *Aria di Mezzo Carattere* comprehends all such. From the great variety which this air of consequence embraces, as well as from the less emphatic nature of the sentiments to which it belongs, its general expression is not so determined as that of the former classes; yet, with respect to each individual air, the expression is far from being vague or dubious: and though some greater latitude be here granted to the fancy of the composer, nothing is given to his caprice; the sense itself of the words clearly ascertaining, in point both of degree and quality, the expression. The degree ought to be in exact proportion to the placidity or warmth of the sentiment, and its peculiar cast ought to be regulated by the nature of that passion to which the sentiment is allied, for sentiments are but gentler degrees of passion. Thus this class of airs, whilst it retains its own particular character, may by turns have some affinity with almost all other classes; but, whilst its latitude is great in respect to variety, its limitations with regard to degree are obvious: it may be soothing, but not sad; it may be pleasing, but not elevated; it may be lively, but not gay. The motion of this air is by the Italians called *andante*, which is the exact medium of musical time between its extremes of slow and quick.

As the vocal part here is never supposed to be beautiful and interesting as in the higher classes, the orchestra, though it ought never to cover the voice, is not, however, kept in subordination to it ; it is not only allowed to play louder, but frequently introduced by itself, and may on the whole contribute to the general effect of the air. This kind of song is admirably well calculated to give repose and relief to the mind, from the great degree of attention and (with respect to ourselves, at least, we might say) agitation excited by the higher and more pathetic parts of the piece. They possess the true character which belongs to the subordinate parts of a beautiful whole ; as affording a repose, not the effect of a total want of interest, but of an interest which they call forth of a different and more placid kind, which the mind can attend to with more ease, and can enjoy without being exhausted.

ARIA PARLANTE.

The *Aria Parlante*, or speaking air, is that which, from the nature of its subject, admits neither of long notes in the composition, nor of many ornaments in the execution. The rapidity of the motion of the air is proportioned to the violence of the passion which is expressed by it. This species of air goes sometimes by the name of *Aria di Nota*

Parola, and likewise of *Aria Agitata* ; but these are rather subdivisions of the species, and relate to the different degrees of violence of the passions expressed. It may be said to take up expressions just where the *Aria di Mezzo Carattere* leaves it. Some airs of this last class, of the liveliest cast, may approach, indeed, so near to some of the *Parlante* of the agitated kind, that it might perhaps be difficult to say to which class they belonged; but, as soon as the expression begins to be in any degree impetuous, the distinction is evident: as the degree of passion to be expressed increases, the air assumes the name of *Aria Agitata*, *Aria Strepito*, *Aria Infuriata*. Expressions of fear, of joy, of grief, of rage, when at all impetuous to their highest and most frantic degrees, are all comprehended under the various subdivisions of the class. Their subject has its peculiar province; the effect of this kind of airs depending, perhaps, chiefly on its powers. The instrumental parts are here likewise of great efficacy, particularly in the expression of the more violent passions, giving, by the addition of a great body of sound, and by the distinctness and rapidity of their execution, a force and energy to the whole, which could never be the effect of the voice alone, however flexible, however powerful. Rousseau, somewhere in his works, makes a very ingenious

observation, the truth of which the Italian composers seem evidently to have felt, that, as violent passion has a tendency to choke the voice, so, in the expression of it by musical sounds, a *roulade*, which is a regular succession of notes up or down, or both, rapidly pronounced on one vowel, has often a more powerful effect than distinct articulation: such passages are sometimes introduced into airs of this kind.

ARIA DI BRAVURA.

The *Aria di Bravura*—*Aria d' Agilita*, is that which is composed chiefly, indeed too often, merely to indulge the singer in the display of certain powers in the execution, particularly extraordinary agility or compass of voice. Though this kind of air may be sometimes introduced with some effect, and without violation of propriety, yet, in general, the means are here confounded with the end: dexterity (if we may be allowed the expression) and artifice, instead of serving as the instruments, being made the object of the work. Such are the airs which, with us, we so frequently observe sung to ears erect and gaping mouths, whilst the heart, in honest apathy, is carrying on its mere animal functions; and of this kind, indeed, are all the attempts in the different arts, to substitute what is difficult or novel for what is beautiful and

natural. Where there has ever been a genuine taste for any of the arts, this aptness to admire what is new and difficult is one of the first symptoms of the decline of that taste.

AIRS OF IMITATION.

Mr. Brown has added to this enumeration another species, which he calls airs of imitation, derived from the metaphorical analogies which a fertile imagination is prone to make between the sounds of music and natural appearances. For instance, the air of "Hush, ye pretty warbling choir," in *Acis and Galatea*, he considers an example of an imitative air, in which however there is no comparison made; the imitative part is only suggested by the sense, and the composer has taken the hint in adapting the music to it, and has done it indeed with the utmost propriety as well as ingenuity. It is plain, in this air, that if the imitation of any thing is to be at all attempted, it must be that of the warbling choir: and it is as plain, that the passionate expression of the speaker has not even the most distant relation to the singing of birds; to have set the voice a-singing, in imitation of the birds, or, whilst the voice sang the passionate part, to have made the birds sing in unison, or, in direct harmony with the voice, would have been each equally absurd. It would seem, indeed,

at first sight, almost impossible to reconcile two things so different ; yet this great genius, by confining each part to its proper province, has so artfully managed the composition, that, whilst the vocal most feelingly speaks the passion, a little flageolet from the orchestra carries on, throughout, the delightful warbling of the choir, and though perfectly different in sound, melody, and rhythm, from the notes sung by the voice, instead of distracting the attention, adds beauty and grace to the effect ; just as we may conceive a naked figure, so veiled with some light and transparent vestment floating to the wind, as at once completely to reveal the figure, and, by its undulating fold, add new charms both to the motion and the form.

IV.

CADENCES AND TRANSITIONS OF
THE VOICE.

BESIDES the varieties of voice just mentioned, the ear by attention may easily recognise many minute cadences and transitions, which have a very great effect upon the sounds both of speaking and singing. These transitions, so far as regards speaking, Mr. Walker distinguished by the name of slides; and by introducing certain characters and diagrams into his system, endeavoured to establish on this principle a perfect method of oratorical delivery. But so far as we are able to judge, this has had much the same effect on our public speakers who have studied it, as the artificial systems of the rhetoricians had on the oratory of the ancients, and has introduced a kind of singing whine, which is the very reverse of elegance and good taste. This, however, is only the abuse and not the judicious employment of the system itself. On the stage it would not be endured, though it is often allowed to injure and spoil the best efforts of our clergymen and barristers, and has also made its way among our senators. The author's original exposition of this system is a fine example of analytical observation on the subject of the voice, without some notice of which our work would be imperfect.

SKETCH OF MR. WALKER'S SYSTEM OF INFLEXIONS.

All vocal sounds, the author remarks, may be divided into two kinds, namely, speaking sounds, and musical sounds.

Musical sounds are such as continue a given time on one precise point of the musical scale, and leap, as it were, from one note to another; while speaking sounds, instead of dwelling on the note they begin with, slide either upwards or downwards, to the neighbouring notes, without any perceptible rest on any; so that speaking and musical sounds are essentially distinct: the former being constantly in motion from the time they commence; the latter being at rest for some given time in one precise note.

The continual motion of speaking sounds, makes it almost as impossible for the ear to mark their several differences, as it would be for the eye to define an object that is swiftly passing before it, and continually vanishing away; the difficulty of arresting speaking sounds for examination, has made almost all authors suppose it impossible to give any such distinct account of them, as to be of use in speaking and reading; and, indeed, the vast variety of tone which a good reader or speaker throws into delivery, and of which it is

impossible to convey any idea but by imitations, has led us easily to suppose that nothing at all of this variety can be defined and reduced to rule: but when we consider, that whether words are pronounced swiftly or slowly, forcibly or feebly, with the tone of passion, or without it, they must necessarily be pronounced either sliding upwards or downwards, or else going into a monotone or song; when we consider this, we shall find, that the primary division of speaking sounds is into the upward and the downward slide of the voice; and that whatever other diversity of time, tone, or force, is added to speaking, it must necessarily be conveyed by these two slides.

These two slides or inflexions of voice, therefore, are the axes, as it were, on which the force, variety, and harmony, of speaking turns. They may be considered as the great outlines of pronunciation; and if these outlines can be tolerably conveyed to a reader, they must be of nearly the same use to him, as the rough draught of a picture is to a pupil in painting. This, then, we shall attempt to accomplish, by reducing some of the most familiar phrases in the language, and pointing out the inflexion which every ear, however unpractised, will naturally adopt in pronouncing them. These phrases, which are in every body's mouth, will become a kind of *data*, or principles, to which the reader must constantly be referred,

when he is at a loss for the precise sound that is understood by these different inflexions ; and these familiar sounds, it is presumed, will sufficiently instruct him.

It must be premised, that by the rising or falling inflexions, is not meant the pitch of the voice in which the whole word is pronounced, or that loudness or softness which may accompany any pitch ; but that upward or downward slide which the voice makes when the pronunciation of a word is finishing, and which may, therefore, be called the rising and falling inflexion.

So important is a just mixture of those two inflexions, that the moment they are neglected, our pronunciation becomes forceless and monotonous : if the sense of a sentence require the voice to adopt the rising inflexion, on any particular word either in the middle or at the end of a phrase, variety and harmony demand the falling inflexion on one of the preceding words ; and, on the other hand, if emphasis, harmony, or a completion of sense, require the falling inflexion on any word, the word immediately preceding almost always demands the rising inflexion ; so that these inflexions of voice are in an order nearly alternate.

This is very observable in reading a sentence, when we have mistaken the connexion between the members, either by supposing the sense is to be continued when it finishes, or supposing it finished

when it is really to be continued : for in either of these cases, before we have pronounced the last word, we find it necessary to return pretty far back to some of the preceding words, in order to give them such inflexions as are suitable to those which the sense requires on the succeeding words. Thus, in pronouncing the speech of Portius, in Cato, which is generally mispointed, as in the following example :

Remember what our father oft has told us,
The ways of heav'n are dark and intricate,
Puzzled in maze and perplex'd in errors ;
Our understanding traces them in vain,
Lost and bewilder'd in the fruitless search :
Nor sees with how much art the windings run,
Nor where the regular confusion ends.

If, from not having considered this passage, we run the second line into the third, by suspending the voice at "intricate," in the rising inflexion, and dropping it at "errors," in the falling, we find a very improper meaning conveyed ; and if, in recovering ourselves from this improper pronunciation, we take notice of the different manner in which we pronounce the second and third lines, we shall find, that not only the last word of those lines, but that every word alters its inflexion ; for, when we perceive, that by mistaking the pause, we have misconceived the sense, we find it necessary to begin the line again,

and pronounce every word differently, in order to make it harmonious.

But though these two inflexions of voice run through almost every word of which a sentence is composed, they are no where so perceptible as at a long pause: we shall soon perceive the different inflexions with which these words are pronounced. In order to make this different inflexion of voice more easily apprehended, it may not perhaps be irrelevant to make the following remarks. Suppose you are to pronounce the sentence, "Does Cæsar deserve fame or blame?" It is to be presumed, that it will at first sight be pronounced with the proper inflexions by every one that can barely read; and if the reader will but minutely attend to the sounds of the words, "fame" and "blame," he will discover an example of the two inflexions described; the word "fame" having the rising, and the word "blame," the falling inflexion. In order to make this distinction more clear and obvious, if instead of pronouncing the word "fame" slightly, a stronger emphatic force be given to it, while it is drawled off the tongue for some time before the sound finishes, it will be found to slide upwards, and end in a rising tone. If the same experiment be made with the word "blame," the sound may be perceived to slide downwards, and end in a falling tone. Now it is to be remarked,

that this drawling pronunciation, though it lengthens the sounds beyond their proper duration, does not alter them essentially, the same inflexions being preserved as in common pronunciation, and the distinction, though not so perceptible, is as real in one mode of pronouncing as in the other.

As to these two inflexions, every pause of whatever kind must adopt one of them, or continue monotonous. When, for example, we ask a question without the interrogative words, we naturally adopt the rising inflexion on the last word, as in the sentence—"Can Cæsar deserve blame? Impossible!"—in which "blame," the last word of the question, has the rising inflexion, contrary to the inflexion on that word in the instance mentioned in the preceding paragraph; while the word "impossible," which has the note of admiration, has the falling inflexion. When the pause marked by the comma occurs, it is most frequently accompanied by the rising inflexion, as in the sentence, "If Cæsar deserve blame, he ought to have no fame." The only difference in the inflexion of the word "blame," here marked by a comma, from that above, in which it was marked by a note of interrogation, is, that the inflexion does not slide quite so high, particularly if a strong emphasis be used in the pronunciation.

The inflexion which ought to follow the semi-

colon, the colon, and the period, may be either the rising or falling according as the sense or the harmony requires, adapting the elevation or depression to different degrees, as may be required; though the different degrees of rising and falling on the inflexion which ends the word, are by no means so essential as the kind of inflexion. The following sentences are given by Mr. Walker as examples of what has been described.

“As we cannot discern the shadow moving along the dial-plate, so the advances we make in knowledge are only perceived by the distance gone over.”

“As we perceive the shadow to have moved, but did not perceive it moving; so our advances in learning, consisting of insensible steps, are only perceivable by the distance.”

“As we perceive the shadow to have moved along the dial, but did not perceive it moving; it appears that the grass has grown though nobody ever saw it grow: so the advances we make in knowledge, as they consist of such minute steps, are only perceivable by the distance.”

In these examples, the words “dial-plate,” “moving,” and “grow,” marked with the comma, the semicolon, and the colon, must necessarily end with the rising inflexion; and if this inflexion be employed, it is not of any consequence to the sense

whether it be raised much or little. On the contrary, if the falling inflexion be adopted to any of these words, though the degree of it may be little more than perceptible, the sense, as will be found on trial, will be greatly altered. The very same points, however, if the sentence were differently constructed, would require the falling inflexion.

In a series of emphatic particulars, though these be only marked by commas, the falling inflexion, for the sake of force and precision, must be adopted: of this the true pronunciation of the following sentence will furnish an example. "I tell you,—though you,—though all the world,—though an angel from heaven, were to affirm the truth of it, I could not believe it." You may prove the justness of the principle, by repeating the emphatic particulars in this sentence with the opposite inflexion, or the suspension which usually accompanies a comma when it is not emphatic. In pronouncing the sentence under consideration, therefore, in order to give force and precision to every particular, the falling inflexion must be employed for the words "you," "world," and "heaven;" not that all emphasis necessarily adopts the falling inflexion, but because this inflexion is generally annexed to emphasis, for want of a just idea of the distinction of inflexion which it has been here attempted to establish.

The following example will exhibit an instance of the falling inflexion in sentences, the members of which are generally marked with a semicolon and a colon. "Persons of good taste expect to be pleased, at the same time they are informed; think that the best sense always deserves the best language: but still the chief regard is to be had to perspicuity." From the structure of this sentence, the words "informed" and "language," which are marked, the one with a semicolon and the other with a colon, require the falling inflexion, contrary to that annexed to the same points in the preceding sentence. The period in each sentence has the falling inflexion, and in the last sentence is pronounced in a lower tone of voice than the same inflexion on the colon and semicolon.

We see, from these examples, that whatever variety of another kind, such as loudness or softness, highness or lowness, swiftness or slowness, or whatever other variety we may accompany the points with, they must necessarily adopt either the rising or falling inflexion, or be pronounced in a monotonous manner. It would appear consequently, that the inflexions, which are the most marked distinctions in reading and speaking, are perhaps not improperly pitched upon to serve as guides to an accurate pronunciation. As so much however depends, according to Mr. Walker, upon

a just notion of this real though delicate distinction, it may not be out of place to give his explanation of it in another point of view, which may to some be more distinct, and more easily comprehended.

It may be said, then, that every sentence consisting of an affirmation and negation directly opposed to each other, has an appropriated pronunciation, which, in earnest speaking, every ear adopts without any premeditation. In the sentence, for example, "Cæsar does not deserve fame, but blame;" the word "fame," has the rising, and "blame," the falling inflexion; and we find all sentences constructed in the same manner have, like this, the rising inflexion on the negative, and the falling inflexion on the affirmative member. The word "blame," therefore, in this sentence, has not the falling inflexion on it, because it is the last word, but because affirmation, when opposed to negation, ought to have this inflexion, and it will appear harsh or unmeaning if it be not adopted.

Thus far, continues Mr. Walker, the choice has been made of words different in sense, though similar in sound, that the sentence might appear to carry some meaning with it, and the reader be led to annex those inflexions to the words which the sense seemed to demand; but, perhaps, the shortest method of conveying the nature of these

inflexions, would be to take the same word, and place it in the interrogative and declarative sentences in opposition to itself: thus it is certain, that every speaker, upon pronouncing the following phrase, would give the first “fame” in each line, the rising, and the last “fame” in each line, the falling inflexion.

“Does he say fame, or fame?”

“He does not say fame, but fame?”

But in this instance, an ear, which cannot discern the true difference of sound in these words, will be apt to suppose that what difference there is, arises from the last “fame,” being pronounced in a lower tone than the first. This, however, it may be remarked, makes no essential difference; for though the last word be pronounced in as high a key as you please, provided that the proper inflexion be preserved, the contrast to the preceding word will still appear. As a proof of this, let us pronounce the last word of the last phrase with a strong emphasis, and we shall find, that though it is in a higher key than the first word “fame,” the voice slides, or, is inflected in a contrary direction. We find accordingly, that if we lay the strong emphasis upon the first “fame,” in the following sentence, the last “fame” will take the rising inflexion: “He says fame, and not fame.” So that the inflexions on the first and last “fame” in this sen-

tence, are in an opposite order to the same inflexions on the same words in the two former phrases.

Perhaps, however, the ear of the reader is by this time not a little puzzled with the sounds of single words, and it may not be amiss, therefore, to try it with the same inflexions terminating the members of sentences, as this may not only convey the nature of the two inflexions better than by sounding them upon single words, but give at the same time a better idea of their importance and utility. It is requested for this purpose, that the reader try over the following passage from Addison's critique on *Paradise Lost*, by reading it so as to place the rising inflexion, or that commonly marked by a comma, on every particular of the series; "The descriptive part of this allegory is likewise very strong and full of sublime ideas: the figure of death, the regal crown upon his head, his menace of Satan, his advancing to the combat, the outcry at his birth,—are circumstances too noble to be passed over in silence, and extremely suitable to this king of terrors." After this experiment has been made, let him then practise it over by reading it so as to place the falling inflexion, or that commonly marked by a colon, on every particular of this series but the last, which may be pronounced with the rising inflexion marked by the comma, according to the following mode of punctuation :

“The descriptive part of this allegory is likewise very strong, and full of sublime ideas: the figure of death: the regal crown upon his head: his menace of Satan: his advancing to the combat: the outcry at his birth, are circumstances too noble to be passed over in silence, and extremely suitable to this king of terrors.” This last manner of reading the sentence, Mr. Walker thinks is unquestionably the true one, as it throws a kind of emphasis on each member, which forms a beautiful climax, entirely lost in the common mode of pronouncing them.

Should the reader, from this description of the inflexions of the voice, be so far able to understand them, as to be sensible of the great difference there is between suspending the voice at every comma in the first example, and giving it a forcible downward direction at every colon in the two last examples, it is presumed he will sufficiently conceive, that this distinction of the two leading inflexions of the voice may be applied to the most useful purposes in the art of reading.

OBJECTIONS TO MR. WALKER'S SYSTEM.

This system, which is evidently founded on the national tones of this country, rather than upon nature, has been, like most other artificial systems, very much abused and productive of more injury in many cases than of benefit. The reason is, that in order to teach it thoroughly, and impress it upon the pupil, the inflexions must be caricatured, and made more distinct and strong than they are in natural, elegant, and easy pronunciation. The falling slide must be carried several notes downwards, and the rising slide several notes upwards, instead of a single note or half note, as it ought to be. The pupil being in this manner taught the elements of the system in a caricatured artificial manner, has his ear and his taste so corrupted, that he carries the same caricature into his finished manner of delivery, and renders himself ridiculous and disgusting, as it is uniformly set down by the hearers to affectation,—the very worst fault which a speaker can be guilty of. It would be better to have the unstudied manner of every-day life in public speaking, however ungainly, than this system of caricatured elocution so much in fashion among professional students.

One argument which we think unanswerable upon this point is, that not one of our great public speakers in any one of the professions adopts this artificial system of inflexions, nor appears to have studied it. Indeed, it would appear finical in the last degree in Mr. Canning, Mr. Brougham, or Dr. Chalmers, to mar their great efforts of oratory by such petty rules of slides and inflexions of the voice. We do not mean to say that they do not employ them; for they are more or less employed by all who speak the English language: but we are certain they do not caricature them as every pupil of teachers of elocution we have ever heard, infallibly does, because he has not art enough to conceal his art, and makes the inflexions so distinct, that they are as offensive to the ear as glaring colours in a painting are to the eye.

We hesitate not to conclude, therefore, that though Mr. Walker has made a most ingenious analysis of the inflexions of the voice, we cannot help thinking, that it is calculated, when brought into actual practice by rule, to produce stiffness, affectation, and a monotonous sing-song manner of speaking—the very reverse of what he intended, and what is expected by those who devote themselves to the artificial study of elocution.

V.

TONE AND PITCH OF THE VOICE.

IN the enumeration of the varying qualities of the voice, in a preceding page, many of them, it may be observed, depend on what is called the *tone*, which is a very vague and indefinite term, but as we have no better to substitute for it, we must explain it in the best way we can. Mr. Bacon has very justly said, that, perhaps the most insurmountable difficulty to writers on the vocal art, lies in the deficiency of both language and characters to convey any precise idea of *Tone*. To say that a tone is loud or soft, full or thin, sweet or brilliant, rich, smooth or harsh, conveys no notion which can be interpreted by all men in the same sense : nor is there any standard to which we can refer ; for no two voices are alike, and no voice bears any near resemblance to the tone of any instrument. Voices, also, may be altogether unlike, and yet be equally agreeable ; because it is requisite, in order to mark different shades of emotion and passion, to have great diversity in the volume, and even in the quality of the tone. Accordingly, it is by no means uncommon to find that a speaker or singer, with but a moderate share of voice, can affect the hearer infinitely more than one whose mere tone is in itself much more pleasing ; while,

on the contrary, there are very illustrious instances of individuals, whose powers of expression are exceedingly limited, and whose powers of attraction lie simply in tone and facility. But though these circumstances make it impossible to determine absolutely the nature and effects of tone, yet it is clear that all expression, purely vocal, depends upon this agent, because tone is the vehicle both of elocution and of execution, and the success of the speaker or the singer varies according to the manner in which the hearer is affected by the modifications of tone. There must be one pervading quality perceptible throughout; and although art may deviate into very wide extremes from this basis, yet these distances are never so remote as wholly to quit the ground-work of an original distinction.

PURITY OF TONE.

Certain national vitiations of tone may, perhaps be traced to the prevalence of peculiar states of the vocal organs in the usual pronunciation of particular languages. The French, for example, have a nasal, the Germans a guttural, and the English a sibilant tone, because these are the characteristics of the several languages; while the Italians, whose smooth and gliding syllables are lubricated by the constant succession of vowels, evince, in the uni-

formity of their conduct of the voice, that they have a regular and certain method of producing tone, which is the purest and the best that art has hitherto produced. It appears, according to the best judges, that the Italians form the tone in singing more at the back of the mouth, keeping the throat moderately open, than either in the chest, the head, or the throat itself. There is, indeed, a place near the back of the mouth where the voice, whether from the head or the chest, must pass; and it appears as if the Italian method of voicing brings the tone to this spot previous to its production, and sends it forth in its finished state from that precise point, untainted either by the nose or the throat, the mouth or the lips. The mouth, which the English singer causes to take a distinguished part in the production of his tones, has little, if any immediate influence in the formation of the Italian tone. In the latter, the mouth and lips are much more visibly at rest; they assume a gently smiling character; and the opening of the lips is lengthened, rather than rounded as in English singing.

It is evident, then, that a certain position of the mouth is to be chosen, which produces the best natural sound, that is, a sound which is most free from adulteration of the nose, the throat, the mouth, or the lips. Such a tone is neither, to

speak accurately, *di petto* nor *di testa*, neither from the chest nor the head, but from a region somewhere between both, where it receives its last polish. The tone must never be vitiated, not even when it is adapted to the expression of passion; and must preserve the undeviating purity which we perceive to be exactly the same in all well-taught singers. This is undoubtedly the pure natural tone, though it be acquired by instruction and imitation. It can only be properly acquired in the first instance by imitation, and unless the first idea is minutely and correctly given and confirmed by constant and undeviating practice, and the mechanical agency irrevocably fixed, the tone will in most cases be imperfectly formed; yet upon this original understanding and conformation of the organs all the after-structure depends. The inculcation, therefore, of correct first principles, cannot be too strongly and peremptorily insisted on. The voice, indeed, will either be made or marred at the very outset; and without the due exercise of judgment in forming the tone, and long perseverance in fixing the scale upon the mind, so as to influence the organs employed in the utterance, it is impossible that a fine pure tone of voice can ever be acquired. Nature and habit are alike concerned; and the reason why so few of our countrymen have attained perfection in this, is, that they

so impatiently quit this indispensable part of the process for the study of what are commonly, but erroneously, considered to be more important branches of the vocal art.

THE TONES OF PASSION.

The vital principle of the voice, it has been remarked by a practical author, consists in those tones which express the emotions of the mind; and the language of ideas, however correctly delivered, without the addition of this language of the passions, will prove cold and uninteresting. As there are other things, therefore, which pass in the mind besides ideas, and as we are not wholly made up of intellect, but, on the contrary, the passions and the fancy compose great part of our complicated frame, and as the operations of these are attended with an infinite variety of emotions in the mind, both in kind and degree,—it is evident, that, unless there be some means found of manifesting those emotions, all that passes in the mind of one man cannot be communicated to another. Now, as, in order to know what another knows, and in the same manner that he knows it, an exact transcript of the ideas that pass in the mind of one man must be made by sensible marks on the mind of another; so, in order to feel what another feels, the emotions which are in the mind

of one man must be communicated to the mind of another by sensible marks. Now these marks cannot possibly be words, which are merely signs of things, and ideas perhaps exciting emotions, but not of emotions themselves.

The reader will at once acknowledge, that the terms anger, fear, love, hatred, pity, grief, will not excite in him sensations of those passions, and make him angry or afraid, compassionate or grieved; nor, should a man declare himself to be under the influence of any of those passions in the most explicit and strong words that language can afford, would he in the least affect us, or gain any credit, if he used no signs but words. If any one should say, in the same tone of voice that he used in delivering indifferent propositions from a cool understanding, "Surely, never any mortal was so overwhelmed with grief as I am at present!" or, "My rage is roused to such a pitch of frenzy I cannot command it; avoid me—begone this instant, or I shall tear you to pieces!"—no one would feel any pity for the distress of the former, nor any fear from the threats of the latter. We should either imagine that he jested, or, if he would be thought serious, we should laugh at his absurdity. And why?—Because he makes use of words, only as the signs of emotions, which it is impossible they can represent; and omits the use of the true

signs of the passions, which are *tones*, looks, and gestures.

Intellectual improvement in a high degree falls to the lot of few, and it is not necessary for all; but though it be not indispensable to society that all men should know much, it is necessary that they should feel much, and have a mutual sympathy in whatsoever affects their fellow-creatures. Tones are the means for exciting this sympathy, and are understood by all mankind, however differing in language and character, in rudeness or refinement. That the whole energy, or power of exciting analogous emotions in others, lies in the tones themselves, and not in the words, may be known from this—that whenever the force of these passions is extreme, words give place to inarticulate sounds: sighs, murmurings, in love; sobs, groans, and cries, in grief; half-choaked sounds in rage; and shrieks in terror,—are the only language heard. This language of the passions is extended to all animals: those of the same species feel mutual sympathy; those of different species feel, if the prey of each other, mutual antipathy: man communicates with all. The horse rejoices in the applauding tones of his rider's voice, and trembles when he changes them to those of anger. What blandishments do we see in the dog, when his master soothes him in kind tones; what fear, and even shame, when he

changes them to those of chiding! By those the waggoner directs his team, and the herdsman his flock. Even animals of the most savage nature are not proof against the collective tones of the human voice; and shouts of multitudes will put wild beasts to flight, who can bear without emotion the roarings of the thunder.

The circumstance is singular, that the ear, from the influence of tones, should excite and strengthen compassion so much more powerfully than the eye. The sigh of a brute animal, the cry forced from him by bodily sufferance, bring about him all his fellows, who, as has often been observed, stand mournfully round the sufferer and would willingly lend him assistance. Man, too, at the sight of suffering, is more apt to be impressed with fear and tremor than with tender compassion; but no sooner does the voice of the sufferer reach him, than the spell is dissolved, and he hastens to him—he is pierced to the heart. Is it that the sound converts the picture in the eye into a living being, and recalls and concentrates in one point our recollection of our own and another's feelings? or is there, as it may be plausibly conjectured, a still deeper organic cause? At all events, we know that the fact is precisely as we have represented it, and it shows that tone is the principal source of man's compassion. We sympathise less with a

creature that cannot sigh; as it is destitute of lungs, more imperfect, and less resembling ourselves in its organization. Some who have been born deaf and dumb, have given the most horrible examples of want of compassion and sympathy with men and beasts, and instances enow may be observed among savage nations. Yet even among these the law of nature may be perceived: fathers, who are compelled by hunger and want to sacrifice their children, devote them to death in the womb, before they have beheld their eyes—before they have heard the sound of their voices; and many infanticides have confessed, that nothing was so painful to them—nothing took such fast hold of their memory, as the first feeble voice, the suppliant cry of their child.

THE VARIETY OF TONE.

What has been already said of the inflexions of the voice according to the system of Mr. Walker, is considerably different from what we here mean by the variety of tone, or modulation of the voice, which ought to be so managed as to produce grateful melody to the ear. Upon the modulation of the voice, depends that variety which is so pleasing, and so necessary to refresh and relieve the ear in a long oration. The opposite fault is monotony, which becomes at last so disagreeable,

as to defeat altogether the success of a public speaker (as far as to please is any part of his object), by exciting the utmost impatience and disgust in his audience. To the variety so grateful to the ear, not only change of tone is requisite, but also change of delivery. According to the subject, the rapidity of utterance varies, as the time of the different movements in music. Narration proceeds equably, the pathetic slowly, instruction authoritatively, determination with rigour, and passion with rapidity; all of which are analogous to the *andante*, the *cantabile*, the *allegro*, the *presto*, and other musical expressions.

Variety, it has been remarked by Quintilian, alone constitutes eloquent delivery; and let it not be imagined, that the equality of the voice already recommended is inconsistent with variety; for unevenness is the fault opposite to equability; and the opposite of variety, is that monotony which consists in one unvaried form or tone of expression. The art of varying the tones of the voice, not only affords pleasure and relief to the hearer, but, by the alternation of labour, relieves the speaker, in the same manner as changes are grateful of the postures and motions, of standing, walking, sitting, and lying,—and we cannot for a long time together submit to any one of them.

The voice, Quintilian adds, ought to be adapted

to the subject and the feelings of the mind, so as not to be at variance with the expressions: this is the great art. We should, therefore, guard against that uniformity of character called by the Greeks monotony; which is an unvarying effort of the lungs and of the tones. But we should avoid not only shouting like madmen, but also that under voice in speaking which is deficient in emotion, and that low murmur which destroys all energy: yet even in the same passages, and in the expressions of the same feelings, there must be in the voice certain nice changes, according as the dignity of the language, the nature of the sentiments, the conclusion, the beginning, or the transitions, require. For, painters who confine themselves to one colour only, nevertheless bring out some parts more strongly, and touch others more faintly; and this they are obliged to do, in order to preserve the just forms and lines of their figures.

It is always considered to be an essential quality of good elocution, both in speaking and singing, that a certain moderate standard of tone be constantly maintained; and increasing or diminishing this tone, or modulating out of it, has the effect of varying the sentiment expressed. In reading, pathetic expression is produced by low, sweet, tremulous tones; and the same is true of singing. In reading, also, a grand, lofty, and swelling tone

confers dignity ; the expression of anger is rapid and violent ; of joy, light and sprightly. In singing, the same modes of expression are employed, with this difference, that singing admits less of quick and violent utterance, while the tender and pathetic feelings are represented by a more protracted and less interrupted style of elocution. Nature has created so many varieties of intellect and of sensibility, which give rise to so many shades of passion, that although the sources of sensation are the same in all men, we should seem to differ prodigiously in those faculties and powers by which their effects, when elaborated and brought forth in their modified state, are so highly exalted.

Every composition, both of oratory and music, implies a certain character in him who utters the sentiments. For example, when an air belongs to any piece representing an action, it ought to be accompanied with a characteristic variation of tone as well as of deportment. The tyrant and the lover not only require a different style, but a different manner. The dignity or tenderness is so mixed with the effect, that the song has commonly the credit of the whole. In airs unconnected with any story, although the emotion appears to be excited wholly by the composition, the feelings that originate in the song, are perhaps imperceptibly, by ourselves, attributed to the singer. This train of

thinking, therefore, allows a warmer and more glowing and enthusiastic manner of expression, than is assumed in the first impression the mere words or melody may make on the judgment. The colouring of the fine arts always oversteps the modesty of nature ; the sympathy of observers accompanies it to a certain point; and being dissolved, whenever this colouring becomes too violent, may be esteemed the test of excellence. This is the personification as well as the poetry of the art.

PITCH OF THE VOICE.

The voice, in all its varieties of utterance in speaking and singing, may be remarked to move within a limited compass, above or below which it cannot reach without disagreeable straining. The mode, however, of moving within this compass is different in each. The musical tones are placed at considerable intervals, which are passed by complete leaps. The speaking tones are at very small intervals, through which the voice slides by the ascending or descending inflexions, as above described in the system of Mr. Walker. Within the limits of the excursion of both, there are certain favourable stations, which are preferred for the pitch or key note from which the intervals are calculated, and to which the modulations are referred.

It may be said, according to these principles, that every man has a certain pitch of voice, within the compass of which he can speak or sing with most ease to himself, and most agreeably to others. This may be called the natural pitch, and is that in which we usually converse : it is this which must be the basis of every improvement acquired from art or exercise.

As a basis, therefore, or starting-point for this natural pitch of the voice, the middle tones are evidently the most advantageous ; as well because the voice has the command of the tones both above and below, within its compass, as that these tones are generally used in common discourse, and the organs must consequently be much strengthened in them by habitual exercise.

Much of the ease of the speaker, and much also of the effect of his discourse, depends upon the proper pitching of the voice. If he deliver his sentiments with facility, they are heard so far with pleasure ; but if his efforts to make himself heard are attended with manifest pain, his audience will be impatient for his relief and for their own, whatever may be the merit of his discourse. He who shouts at the top of his voice, is almost sure to break it, while he destroys his own feelings, becomes a mere brawler, and stuns his

audience. He who mutters below the natural pitch of his voice, soon wearies himself, becomes inaudible, and altogether oppresses his hearers. Each extreme, therefore, is almost equally disagreeable and disadvantageous to the object of public speaking, though not equally irremediable.

It is agreed to from experience by all public speakers, that it is much easier to raise than to lower the pitch of a discourse; and therefore the high extreme is most particularly to be guarded against. From the lower, unless the speaker be altogether exhausted, he may with less difficulty ascend. A change of key, where that is advisable, must be conducted on the same principles by the speaker as by the musician. This occurs in music, in a new movement or division, and must take place in speaking after a considerable pause; or, if it be necessary to make the change before, it must not take place abruptly, but go through certain gradations, or, as it were, modulations, otherwise the sudden transition will offend in the extreme. The descending modulations are found to be much more difficult to the speaker than the ascending ones, for a cause which has not been assigned, and therefore he should be more particularly careful not to remain long in that pitch, whence it may be beyond his ability to descend without exposing his want of skill. He must

consequently be cautious in the commencement of his discourse, and so construct the spirited parts of it, that they shall only occasionally run him into the high tones of his voice, but not detain him too long there. This precept will apply figuratively with equal advantage to his composition, which ought not to dwell very long on the vehement strain.

This rule is carefully observed by the composers of Italian song. The voice is made to slide gradually, or to make a run up to its very highest notes, from which it is also made to descend speedily. This contrivance gives to the air and to the performer every advantage of brilliancy, without fatigue to the voice or pain to the hearer. It is worthy of imitation, though it is but seldom attended to by our composers. The upper parts of glees, which are sometimes executed by female voices, if they are not intended for them, particularly err against the rule; and are found to squeak perpetually within small limits, at the very extreme pitch of the voice.

With respect to the pitch of the voice, nothing will lead to greater mistakes than the confounding of high and low tones with those which are loud and soft; for if, in an attempt to make the voice louder and better heard, the key is raised to a pitch at which the tones become shrill and

feeble, the speaker's intention will be quite frustrated. It may be useful, therefore, to explain this distinction, in order to prevent this mistake. —By a high tone, then, we mean that which we naturally assume when we wish to be heard at a distance, as the same degree of voice is more audible in a high than in a low tone, from the acuteness of the former and the gravity of the latter. By a low tone, again, we mean that which we naturally assume when we are speaking to a person at a small distance, and wish not to be heard by others, as in these circumstances a low tone with the same force is less audible than a high one. If, therefore, we raise our voice to the pitch we should naturally use if we were calling to a person at a great distance, and at the same time exert so small a degree of force as to be heard only by a person who is near us, we shall have an example of a high note in a soft tone. If we suppose ourselves, on the contrary, speaking to a person at a small distance, and wish to be heard by those who are at a greater, we will, in these circumstances, naturally sink the voice into a low note, and throw just as much force or loudness into it as is necessary to make it audible to the persons at a distance. The low tone conveys the idea of speaking to a person near us, and the loud tone enables us to convey this idea to

a distance. These distinctions it will be requisite to bear in mind.

We have already more than once remarked, that the voice slides more readily into a higher than a lower tone during a continued effort of speaking; and hence the rule has been judiciously derived, to begin under the common level of the voice rather than above it. This is found to be the best method of attaining the proper key, or natural pitch of the voice. It is hence with great propriety (exclusive of the suitable tone of prayer) that preachers are accustomed to begin at the lowest tone of their voice, so as sometimes to be scarcely audible, though the attention of the audience, at the commencement, is usually such as to favour the hearing of the softest accents. The speaker thus, as it were, feels the room with his voice, and is better able to determine what key to adopt, which shall regulate the whole tenor of his discourse. For this purpose it was recommended by Mr. Sheridan, that the speaker should address himself to some person at the greatest distance in the audience, whom if his voice reach so as to be easily heard, it will be certain that all the intermediate persons will also hear. Mr. Sheridan also says, that the voice should not be raised in pitch, but in force and quantity, according to the distance,—a rule which

accords with the remarks which have just been made.

Mr. Sheridan's first rule, however, is liable to considerable objection; for though it would answer sufficiently well if only a short sentence or two were to be delivered to a great assembly, yet a long discourse begun in this manner is likely to run into the extreme pitch in height, and to become a clamorous vociferation rather than distinct and intelligible speaking. Mr. Walker, therefore, in opposition to Sheridan, cautions the public speaker against a loud and vociferous beginning, and recommends him to adapt his voice at first so as only to be heard by the person nearest to him; remarking, that if the voice be naturally strong or distinct, it will insensibly steal into a higher and louder tone; and the greatest address, in this case, will be requisite to keep the voice within due bounds. In order to accomplish this, the voice ought frequently to be recalled, if the expression be permitted, from the extremities of the auditory, and addressed to those nearest to the speaker. This should be done at every considerable pause, or at the beginning of every head and subdivision of the discourse; for nothing, as Mr. Walker observes, will so powerfully work on the voice, as the speaker to suppose himself conversing at different intervals with different parts of an auditory.

It is of importance, therefore, to impress upon the minds of our readers, that if the voice be articulate and distinct, however low the key may be, it will still be audible. Accordingly we find that many public speakers who have very weak voices, make themselves distinctly heard by attending to this simple rule. A great deal, no doubt, depends on the size and structure of the place. Some of our churches and cathedrals, for example, are so large and spacious, that the voice is almost as much dissipated as in the open air, or, what is worse, broken and confused by echoes from the arched structure of the edifices. On the other hand, if the place be small, the loudness of the voice must be in proportion. In both the one case and the other, a loud and vociferous speaker will render himself unintelligible in proportion to the extent and the exertion of his voice; for the departing and commencing sounds will encounter each other, and defeat every intention of distinct articulation and agreeable speaking.

It appears then that *piano* and *forte*, so far as regards the voice, having no relation to pitch or key, but to force and quantity, this must depend on the power of the lungs, and the body or volume which the speaker or singer can give out, and not upon the adjustment of the organs of the voice. A voice, accordingly, is powerful in proportion to

the quantity of sound it is able to issue, and is soft or loud in proportion to the quantity it actually does issue. The power of the voice, then, it would appear from this, is altogether a gift of nature, at least as far as other bodily powers are so. It may like them be improved by cultivation and exercise, as we shall show; but cannot be materially changed from natural feebleness to strength, nor the reverse: but, on the other hand, the pitch and management of it are altogether within the province of art. Thus experience demonstrates, that a voice which may not by nature be perfect and strong, may, by due cultivation and art, be able to sustain greater efforts, and to afford more pleasure to the hearer, than the uncultivated voice of a Stentor, which will break itself down by its own force. As this is one of the most important things for a public speaker, we shall select the following

RULES FOR REGULATING THE PITCH OF THE VOICE.

The actual practice of the pitch and tones to be adopted, should take place always, if possible, by way of rehearsal previous to public delivery; and when time and opportunity do not permit this, the manner in which the voice should be managed in different parts of the discourse ought to be con-

sidered and determined. This practice was followed by the ancients, and was called the silent preparation of the voice. Cresollius illustrates this by a singular story from Plutarch. A barber at Rome had a magpie which afforded him and the neighbourhood great amusement, by its imitative garrulity and songs: it happened that the funeral of a wealthy citizen stopped in procession, near the barber's shop, and a solemn concert of trumpets was performed. The magpie, for three days after this, remained in profound silence, so that his master thought he had been stunned by the sound of the trumpets, and it was feared that his talents and his voice were thereby lost. But after his long silence, to the admiration of every one, he began to imitate with incredible correctness the sounds and modulations of the whole concert; so that the cause of his three days' silence, says Plutarch, with great naïveté, was the exercise and meditation within himself of his talent of imitation, and his silent tuning and adapting his voice like a musical instrument.

Mrs. Siddons, it is reported, always prepared herself for her great efforts, by this sort of silent meditation, to which perhaps she owed not a little of the pathos, variety, and effect of her voice.

As the middle pitch of the voice admits of ascending or descending most naturally and freely,

and is the most favourable to ease and variety, while the organs from practice are also stronger in this pitch, every speaker should endeavour to deliver the principal part of his discourse in the middle pitch of his voice. This pitch will be found to be nearly that used in common discourse, when we address ourselves to each other at the distance perhaps of twelve or fifteen feet, in an ordinary room. The inexperienced speaker is recommended, then, to endeavour to deliver himself as nearly as possible in this ordinary pitch, and not to think it necessary to seek for some unpractised tones, which might lead him into error and affectation.

The tones of the speaking voice, ascending from the lowest to the highest, may conveniently be considered in the following order : the whisper—audible only to the nearest person ; the low speaking tone or murmur—suited to close conversation ; the ordinary or middle pitch—suited to general conversation ; the elevated pitch—used in earnest argument ; and the extreme pitch—used in violent passion. These different tones are sensibly distinct and separated from each other. They may be subject to variation, according to the quantity of voice necessary to be issued, from that which in each case is used in speaking to one individual, to the quantity necessary to be given out in addressing a multitude.

In order to gain a habit of lowering the voice, the speaker should acquire a habit of dropping the voice to a lower key at the end of one sentence, and commence the next in the same low key with which the former concluded. To acquire this, the best method will be to select sentences which naturally require this manner of enunciation, and frequently practise reading them aloud.

The speaker will find that this lowering of the voice will be greatly facilitated by beginning the words, which it is wished to lower, in a monotone or sameness of sound similar to that produced by repeatedly striking the same key of a piano forte. A monotone indeed, though in a low key and without force, is much more sonorous and audible than when the voice slides up and down at almost every word, as it must do to be various. This tone is adopted by actors, when they repeat passages aside. They are to give the idea of speaking to themselves, in such a manner as not to be heard by the person with them on the stage, and yet must necessarily be heard by the whole theatre. The monotone, in a loud key, answers both these purposes. It conveys the idea of being inaudible to the actors with them in the scene, by being in a lower tone than that used in the dialogue, and, by being in a monotone, becomes audible to the whole house. The monotone, therefore, becomes an excellent me-

dium for such passages as require force and audibility in a loud tone.

The voices of individuals being extremely various in power and in the perfection of their various tones, those which are good in the lower tones being often deficient in the higher, and the contrary,—a speaker should, in his public efforts, keep as much as is consistent with variety to the best tone of his voice. In private, on the contrary, he should endeavour to improve by practice the tones which are most deficient. If he be desirous, for example, to improve his low tones, he ought to practise speeches that require little exertion a little below the common pitch. When he can accomplish this with ease, he ought then to try them in a tone still lower, selecting in preference such passages as require a low key and a full audible tone.

If it be desirable, on the other hand, that some of the higher tones be improved, the same exercises of reading passages in a high key, that naturally require it, will be useful and effective. If the voice be observed to grow thin or approach to a squeak upon a high note, it will be advantageous to swell it or give it a little more force, a little below the note where this begins, and to continue this swell for some time in a sort of monotone, to give it more force and audibility. The frequent pronouncing of a succession of questions that require the rising

inflexion will also be an excellent exercise for obtaining the same purpose.

After the voice has been carried to the highest pitch, it will be proper to bring it down to a lower key, by beginning the next sentence in a lower tone; and in extempore speaking this may be managed by the turn of the sentence, or the change of the sentiment, so far as to make the alteration of voice appear natural.

In very spacious rooms, or in large churches or cathedrals, the speaker ought to manage his voice as he would in the open air, in order to make himself audible as much as possible without straining or painful effort. In rooms, again, where the quickly returning echo disturbs the speaker, he must lessen the quantity of his voice till the echo ceases to be perceptible: and if he be disturbed by the slowly returning echo, he must take care to be much slower and distinct in his utterance than usual, and to make his pauses longer. He must attend to the returning sound, and not begin after a pause till the sound has ceased.

The speaker may readily discover whether his voice has filled the room, by the return of its sound to his own ear; and if this returned sound appear strong and forcible, his voice must be too loud for the auditory. The powers of the voice may be estimated from its capability of filling a room of

any particular size by a proportional effort of the lungs.

The attention of the audience is by far the best criterion, both of the audibility of a speaker and of the interest which he awakens ; so much so, indeed, that when the hearers are observed to listen with indifference, or to show marks of impatience, the speaker should either change his tone, his manner, or his sentiments, or conclude as speedily as he can.

VI.

ARTICULATION, ACCENT, AND EMPHASIS.

THOUGH tone may be justly considered the first requisite in a singer, and of great importance to a speaker, yet without a correct and distinct articulation, neither the one nor the other can ever acquire a high rank. Correct articulation, indeed, is the most important exercise of the voice and of the organs of speech, and of the most indispensable necessity ; because any imperfection in this respect obscures every other talent in a public speaker ; while one who is possessed only of a moderate

voice, if he articulate correctly, will be better understood, and heard with greater pleasure, than one who vociferates without judgment. The voice of the latter may, indeed, extend to a considerable distance, but the sound will be dissipated in confusion; while not the smallest vibration of the former is wasted—every tone is perceived at the utmost distance to which it reaches, and hence it has often the appearance of penetrating farther than one which is loud, but badly articulated.

According to the description of Mr. Sheridan, a good articulation consists in giving every letter in a syllable its due proportion of sound, according to the most approved mode of pronouncing it, and in making such a distinction between the syllables of which words are composed, that the ear shall without difficulty acknowledge their number, and perceive at once to which syllable each letter belongs. Where these points are not observed, the articulation must be proportionally defective. In correct articulation, the words are not hurried over, nor precipitated syllable over syllable, and melted as it were together into a mass of confusion. They are neither cut short nor prolonged; neither swallowed, nor forced from the mouth as if they were shot; neither trailed, nor drawled, nor let slip out carelessly, so as to drop unfinished. They are rather delivered out from the lips, as Mr. Austin

says, like beautiful coins newly issued from the mint, deeply and accurately impressed, perfectly finished, neatly struck, distinct, sharp,—in due succession and of due weight.

The great Roman orator was of opinion that good articulation is not only conducive to the improvement of the voice in clearness, strength, and sweetness, but that it is a criterion of the speaker's knowledge of his language. It is required of the voice, he says, that it be strong and sweet; but we must allow that nature alone can effectually bestow these qualities, though practice will improve the one, and the imitation of those who articulate distinctly and deliberately will improve the other. It was distinct articulation alone, indeed, which obtained for the Catuli such high literary reputation; for though they were men of letters, they were not more so than others, and yet they were esteemed to be the best speakers of the Latin language. Their tones were sweet, their syllables neither strongly marked nor smothered—neither affected nor indistinct; and their voice, without effort, was neither languid nor clamorous.

In the English language, the difficulty of acquiring a correct articulation being unusually great, the foundation must be laid at an early age, when the organs are most tractable. If this be not attended to, unconquerable imperfections in utter-

ance may be the consequence, as is often observed in those who in their infancy have been given up to the care of vulgar speakers. In the English language, the articulation is sometimes rendered difficult from the harsh combination of consonants, both in single words and from the meeting of words in their arrangement in sentences. Sometimes it occurs that a word terminates with one or more consonants which require to be articulated by the organs, adjusted in such a manner that they cannot be suddenly and easily changed in order to accommodate the articulation of the following words. The ancient languages, particularly the Greek, allow of, or rather require, many alterations of such letters, in order to prevent such difficult and disagreeable collisions; and also to strengthen the sound where an *hiatus* would otherwise take place, and in every manner to facilitate the articulation. Several modern languages have also contrivances for this purpose, but the English language hardly admits any indulgence of this kind. In composition, therefore, attention ought to be paid to this circumstance; and, as far as smoothness of style is considered important, care should be taken to avoid collisions of this nature. It is not to be desired, however, that this harshness should be altogether polished away, as it forms the strength of our language, and upon its judicious

use much of its vigour and variety depends. Harshness, it has been well remarked by Demetrius Phalarius, contributes in many instances to magnificence. In some respects, the collision of the letters may be displeasing to the ear; but they have the advantage of strongly demonstrating the magnificence of the hero; for the finically polished style, and that which merely pleases the ear by its melody, are seldom used in grand subjects: such were the principles acted upon by the refined Greeks, and the same will apply to the English compositions of the present day.

A very common cause of indistinctness in articulation, is a short and quick way of speaking, which must be corrected by taking more time and leisure; though caution should be taken not to fall into the other extreme—of a lifeless or whining manner of speaking. A due regard to quantity is also indispensable; though this is not an error so likely to be committed in these days as it was formerly, before the multiplication of dictionaries and works on elocution. Above all, a pedantic or affected pronunciation should be avoided; for this is often a cause of imperfect articulation and bad speaking; such, for example, as the changing of open and long into narrow and short vowels, or dropping the consonants, or sounding them very soft and with a supposed air of politeness, which is

in reality mincing and vulgar. An old author well remarks, that if some men, to ingratiate themselves with the other sex, Sardanapalus-like, think affectation necessary in conversing with them, they would do well to confine the prim mouth and the soft voice to those occasions only; and when they speak in public, then to assume the voice and speech of men, that we may not have a female senate, nor women to speak at the bar or in the church.

In singing, a clear and distinct articulation is no less requisite than in speaking; and no classical ear can endure a singer, who pronounces *doy* for die, *moy* for my, *thoy* for thy, &c. The present school of English bass singing, however, proceeds upon the erroneous principle of rounding the mouth in this manner; so that the line "When the din of arms is past," is sung "Oen thoa duin oof ooarms is pooast." The sounding of the syllable *ly* at the end of words, as if it were *loy*, is no less affected and objectionable.

IMPERFECT AND DEFICIENT ARTICULATION.

Whether persons who are subject in any great degree to this defect can ever conquer it, may strongly be doubted; but supposing success possible, the constant vigilance, and the incessant efforts necessary in difficult cases, are such as must

effectually overcome the vigour of ordinary minds, and determine them rather to submit to their deficiency than to the labour of correcting it. In cases where a small degree of hesitation occasionally breaks the fluent tenor of discourse, much may be done by due attention. If, in order to seek a remedy, we might presume to offer an opinion upon this distressing defect, we should say that persons of delicate habits are more generally subject to it: it proceeds from a constitutional trepidation of the nerves; and we should therefore recommend, as the foundation of every hope of cure, such care of the health as may tend to strengthen the whole system.

All excess should be avoided, particularly in the use of wine, tea, and coffee, which give a momentary stimulus, and leave behind increased debility. All personal irregularity ought to be still more carefully guarded against; and then it may be hoped, that, with the growing strength of the constitution, the defect may gradually diminish. That it is sometimes removed, we may judge from the fact, that though we frequently meet with young persons subject to hesitation, we do not, in proportionable numbers, meet grown people who labour under it in any great degree; and that it is owing principally to some nervous affection, may be collected from observing that whatever agitates the

nerves, either increases or diminishes the complaint. The defect is aggravated by the fear of strangers, by surprise, by impatience, by anxiety ; it is moderated by familiar society, by indulgence, and by tranquillity. Since, therefore, in its distressing effects, it is subject to all the variations of bodily health, it may also be presumed to be capable of being relieved by those means which contribute to establish the general health and vigour.

But much of the success in the combat against this defect, will depend on the exertions made by the mind, and on the establishment of such habits as tend to counteract the weakness. A young person should therefore practise to speak with more than usual deliberation, and to practise frequently when alone those words and letters which he finds most difficult to enounce. He should also furnish his mind with a copious vocabulary of language ; and make himself as familiar as possible with all the synonymes, so that if he finds himself unable to utter a particular word, he may readily substitute in its place some other of nearly the same import. The habit of running over synonymes will associate them in such a manner, that the idea of one word will readily bring the other into recollection. It is one character of this impediment, that it is obstinate in struggling with the particular word which stops the current of discourse ; and in

such cases, it appears to be the most advisable method to divert it, if it can be done, into some other channel. Above all, a young person should be encouraged to exert the energy of his own mind, to assume a courageous command over himself, to check his trepidation with determined deliberation ; and should he even fail, not to suffer himself to be disturbed, or to lose his temper, even when laughed at by his thoughtless young companions. If his hesitation be not extreme, these directions may be of some use, and palliate the soil in some degree, till time and strength shall perhaps nearly remove it.

The celebrated Dr. Darwin classes impediment of speech under diseases of association. Impediment of speech is owing to the associations of the organs of speech being interrupted or dissevered by ill-employed sensations, or sensitive motions : as by awe, bashfulness, ambition of shining, or fear of not succeeding ; and the person uses voluntary efforts in vain to regain the broken associations.

The broken association is generally between the first consonant and the succeeding vowel ; as, in endeavouring to pronounce the word parable, the P is voluntarily repeated again and again, but the remainder of the word does not follow ; because the

association between it and the next vowel is dis-severed.

The art of curing this defect, is to cause the stammerer to repeat the word which he finds difficult to speak, eight or ten times without the initial letter, in a strong voice, or with an aspirate before it,—as arable, harable; and at length to speak it very softly with the initial letter P,—parable. This should be practised for weeks or months, upon every word which the stammerer hesitates in pronouncing. To this should be added much commerce with mankind, in order to acquire a carelessness about the opinions of others.

Hippocrates seems to consider this defect to arise from impatience of the organs and fulness of the mind, when the ideas crowd upon each other without due arrangement. “The indistinctiveness,” says he, “of utterance (or impediment of speech) arises from the hearing of external sounds. In the one case, before the sentence which should precede is completed, words foreign from it are introduced; in the other, before that which is conceived is fully expressed, intervening thoughts are charged upon it.

As bad habits are more readily learnt than good ones, because they are more striking and more strongly arrest the attention, stuttering is often

caught by imitation, and especially among children; who for this reason ought never to be entrusted in the company of a stutterer, till their speech has become steady and confirmed. The convulsive action of the muscles in this affection, may often be overcome by a firm and judicious discipline; insomuch, that some of the most distinguished orators, of both ancient and modern times, are well known to have been subject to this affection in their youth. In ordinary conversation, or where a man has time to pick out single words, instead of speaking whole sentences, the stammerer always hesitates most; and hence always least where his attention is completely engrossed. On which account there are many stammerers that scarcely utter a word in speaking without betraying themselves, who, nevertheless, sing and enunciate the words of the song without any hesitation whatever; their whole mind being led away with the tune, and a strong desire to keep in time and harmony: while there are others who hesitate as little in reading; the words being immediately before them, and their attention being swallowed up in the subject. “One of the worst stutterers,” says Dr. Good, “whom I ever knew, was one of the best readers of Milton’s *Paradise Lost*. He was a scholar of considerable attainments, and had taken some pains with himself for his natural defect; but

without success: yet the moment an interesting poem was opened his defect completely vanished, from his being led captive by the force of his subject, and the great interest he took in this branch of polite letters."

This affords us one mean, therefore, of remedying the evil before us: the stammerer should learn by heart, and repeat slowly, whatever most arrests his attention. But, at the same time, the will must learn to obtain a control over the muscles of articulation: and for this purpose single words should be uttered for hours at a time deliberately, and when alone; and, perhaps, too, as was the custom with Demosthenes, a practice of haranguing by the sea-shore, or on the brink of some loud waterfall, where the noise and the magnificence of the scenery have a tendency to break in upon the habit and render the conquest the easier, may be often advantageous. It would, at least, stimulate the speaker to strain his voice to the full extent of its power, and thus fit him for public speaking before large bodies of people, where a loud and elevated voice can alone be heard distinctly; which was, probably, the chief object Demosthenes had in view: for we are expressly told that his voice was weak, as well as his speech tremulous and hesitating. Adults, who have firmness and perseverance enough for the purpose, may undertake the

task of disciplining themselves; but children should always be put under the care of a judicious tutor, whose best qualifications will be patience and good temper. A very few words only should be marked down at a time for trial, and these should be attempted separately; nor should a second lesson be entered upon till the first has been completely mastered, although the effort should demand many weeks, or even months. An acquisition of one lesson will always facilitate that of another.

Another very disagreeable imperfection is the guttural sound of the letter R; an imperfection which was formerly the fashion in France for *petit-mâîtres* to affect, and which they called *parler gras*. Such an affectation has never, we believe, disgraced our taste. The imperfection is best overcome by removing the articulation from the improper seat—the throat, to the proper organs—the tongue and the palate; and by practising to continue the sound of the letter in the proper place, or rather nearer to the teeth. This may be effected by forcing the breath between the palate and the tip of the tongue, and by causing the tongue to vibrate rapidly: although this effort will produce an inarticulate sound, it will be a useful exercise. Words may then be practised in which this letter occurs in various combinations—slowly at first, till the proper method be acquired; and it should be a

principal care to prevent the throat from interfering, or being at all concerned in the articulation. In this, as in every other successful effort of persevering labour, the example of Demosthenes is encouraging, as he completely conquered this defect in his utterance.

In another variety of vitious conversation, the letter L is rendered unduly liquid, or substituted for an R: as when delusive is pronounced deliusive, as though the s possessed the power of the Spanish ll, or the Italian gl; or as when parable is pronounced palable. Alcibiades is said to have laboured under this defect. The Greeks, from the letter *lamda*, denominated this *lamdacismus*; the Romans, with more severity, *lallatio*, or *lullaby-speech*. This is the result of affectation; sometimes, perhaps, from not having the tongue sufficiently free, as where there is too great a length of the frœnum which ties it to the base of the mouth, or too large and oppressive a flow of saliva. As the articulation of R does not enter into some languages, as those of Mexico and China, the S is substituted for it: hence the Jews of the former country, who, from long disuse, have lost the power of pronouncing the R, employ the S in its stead.

In another variety, the harsh letters are vitiously dropped for softer: as in the substitution of anzel

for angel ; capidol for capitol ; *dat* for *that*. This may be the result of a debilitated articulation in children who have been brought up too daintily : but it is more usually the result of affectation, or is founded upon a general principle of softening the rougher or harsher sounds of a language into a smoother and more limpid flow ; as is the case with most of the modern dialects of the South of Europe, and particularly those of Italy and Spain, which are well known to be derived from the Latin. Thus, in the former, we have *piano* for *plano* ; *pian-gere*, and still further, *piagnere*, for *plangere* ; and *egli* for *ille* : and in the latter, *llamar* for *clamare* ; *llaga* for *plaga*, and *hermose* for *formosa*.

It is curious to observe how, in this respect, the most barbarous and the most polished languages agree. It is generally but erroneously conceived, that the former are peculiarly harsh and dissonant ; for savages, in speaking, as in any other exertion, take more pains than are absolutely necessary, and hence content themselves with the soft and simple vowel sounds, or those of the glottis, drawled out, indeed, at too great length ; and when they are driven to the use of consonants, select those that give them least trouble to enunciate. On this account, Lord Monboddo is correct in observing, that “ the words of barbarous languages are long and full of vowels ; not short and full of consonants, as

has been imagined.” “And the following remark,” says Dr. Good, of Dr. Perceval of Dublin, in the manuscript commentary with which he favoured me on the volume of Nosology, is peculiarly in unison with this statement:—‘In a paralytic affection of the organs of articulation, the patient pronounced the word *cocoa, toto*. The Otaheitans call Cooke, *Toote*. Their language is beautifully soft and vocal. A sentence recorded in Cooke’s Second Voyage is distinguished by the harmonious and expressive collocation of its words: *Tootaha taio Toote — mutte Tootaha; — Tootaha*, the friend of Cooke—dead is *Tootaha*.’” Man in savage life is fond of ease, and would not move a muscle if he could help it; in the voluptuousness of polished life he loves it equally, and is, if possible, still less disposed to exertion: and hence this extraordinary accordance in the character of their articulation.

In the balbutient variety, we have the labial letters too frequently repeated, or enunciated too harshly, or used instead of other letters. The Welsh are proverbially addicted to this inelegance, by confounding the V with the F, and the B with P; of which Sir Hugh Evans, in the *Merry Wives of Windsor*, affords a correct and amusing example, “*Fery goot*,” says he, “I will make a prief of it in my not pook!” So *impringe* is often

used for *infringe*, and *ibory* for *ivory*. And thus *Veda* is pronounced *Beda*; and *Venares*, *Benares*, in Bengal; the Bengalee having no such letter or articulation as *V*.

Infants, before they cut their teeth, are constantly using labials too freely, as the lips press together without resistance; and hence they delight in iterating the same labial sound: and it is from a copy of such infantile iteration that we derive the names of *pa-pa* and *ma-ma*, which they first learn to utter.

Persons in a state of intoxication, from the tremulous debility of their lips, often exhibit the same reduplications of the labial sounds; and thus make an approach towards one of these varieties. It is also to be found in persons whose lips are unduly thick and broad,—a deformity distinguished vernacularly by the name of *blobber-lipped*: to which cause Quintilian, who notices this variety of vitious expression, chiefly ascribes it; and hence distinguishes it by the name of *plateiasma*, probably from *Theocritus*—

“Cooing like pigeons, with your blobber-lips.”

A verse designed to ridicule the Doric dialect, and consequently intimating that this kind of vitious enunciation was common to a considerable part of *Achaia*.

The erroneous articulation constituting the next variety, is of a character precisely opposite to the preceding ; and consists in omitting the labials altogether, or exchanging them for others that are softer and more easily uttered.

Thus mantle is broken down into antle, fish into vish, and pilfer into filfer : so in the Spanish, the Latin *ferina* becomes *harina*, and *paba*, *hava* ; and in French, the Latin *sibilo*, siffler. This blemish is especially common to those who are hare-lipped, or have any other kind of defect in either lip, so that the two will play in harmony ; and more particularly still, if any of their front teeth be wanting.

In the dentiloquent variety, the dental sounds, as of *c*, *s*, *t*, *z*, are too frequently employed, producing the effect of what is called lisping, or in common language, speaking through the teeth. This, also, is often an affected blemish, as though it were an elegance instead of a fault in enunciation. It is produced by having a tongue naturally too long, and hence perpetually thrust against the front teeth from necessity, and from a habit of pressing it in this direction too frequently.

The guttural or palatine letters, as *g*, *h*, *j*, *c*, *x*, are sometimes uttered imperfectly, by being introduced where they ought not or withheld where they should be distinctly enunciated ; and in this consists the last variety it may be necessary to notice.

One of the most common examples is in the superfluous use of the aspirate, or *h*, by means of which, *exalt* and *exasperate* are pronounced *exhalt* and *exhasperate*; so *collar* is called *khollar*, and *custom*, *khustom*. And not unfrequently, among men of unfinished education, the aspirate is just as uniformly omitted when it ought to be employed, and employed where it ought to be omitted; whence, for this sentence—"the upper part of the house is to be let unfurnished," we have "the hupper part of the ouse his to be let hunfurnished;" and if the palate be fissured, or in any other way imperfect, "ghost" is pronounced "host;" "jolly," "iolly" or "yolly;" "coffee," "dhoffee;" "Xerxes," "Zherzes."

The hissing of the letter *S*—that reproach to our language—is as far as possible to be moderated, both by attention to composition and enunciation, and should not be exaggerated, as some are found to do.

The letters *M* and *N* are also subject to be imperfectly sounded: instead of passing the sound of *M*, when produced by closing the lips, entirely through the nose, it is stopped or resisted apparently between the bony and cartilaginous part of the nose, and does not issue freely: this may be proved by holding the nose in the fingers, and endeavouring to pronounce words in which those

letters require to be sounded, such as hummums, *nung*, (a German word), singing, ringing, &c., when the sound will appear to be violently impeded in the place mentioned. This defect is called, by a contradictory appellation, speaking through the nose, and is seldom difficult to remove. The sound of the letter N, when formed by pressing the upper part of the tongue against the palate, should also pass entirely through the nose, but more gently than that of M. In its original combinations imperfect articulation is not so disagreeable as when combined with the letter G,—a combination very frequent in our language, and altogether offending to the ear when not perfectly enounced. The words *ringing*, *singing*, sound as if the n were omitted, and are uttered most disagreeably, as if they were *riggig*, *siggig*. The defective articulation of both these letters may be successfully got over by attention and practice, except in cases where nature or accident may have denied the sounds a passage through the proper organ.


INSTRUMENTS FOR SUPPLYING DEFICIENCIES.

When the palate, or any of the parts about the roof or back part of the mouth, are deficient either by accident, by disease, or, what is more common, from birth, the ingenuity of modern surgeons has devised several successful methods of supplying

the deficiency, so as to improve the articulation. Among these we may particularly mention the inventions of M. de la Barre, and Mr. Snell. From the recent observations of the latter on Artificial Palates, we shall borrow a description of these instruments, or *Obturators*, as they are called.

“ M. de la Barre’s instrument is a complete palate, intended to supply the whole of the bony and membranous roof of the mouth. It is constructed in the following manner:—An upper set of mineral teeth, surmounted by a palatine roof, and a circle, or saddle, which surrounded it like the lost substance, in the inside of which was carved a very thin cavity, that represented the thickness and figure of the nasal palatine floor. The teeth and palate were attached to each other by stems inserted into the metallic part in w^hich the teeth were set. To the back part of this instrument was attached a movable velum and uvula, composed of elastic gum. That these might fulfil the natural movements of those parts, during swallowing, an oval aperture was formed upon the fore-part of the plate, to which was connected a valve closing hermetically, this being retained in its situation by a small spring. To this little plate was soldered a lever, which being carried backward, was made to rest upon another that was held equally both ways; being long enough to

engage the principal plate, and flattened in order to lay hold of the movable velum. In swallowing, therefore, the point of the tongue supported itself naturally against the palate, and the valve being pressed upon, transmitted the movement to all the other parts, and the velum became lifted from the vertical to the horizontal position, so that neither food nor drink could ascend into the nose.

“ We are farther indebted to M. de la Barre, for the description of an instrument, intended for supplying the velum and uvula only, in a case in which these organs were entirely destroyed: its construction was as follows:—A plate folded upon itself, of this figure , was made to embrace the posterior part of the nasal palatine floor, the nasal portion fitting up to the vomer, while the palatine portion formed a roof, each side of which gave attachment to a stem, which fixed upon one of the molar teeth on each side, by means of elastic bands with spurs. This apparatus gave support to a very thin piece of elastic gum, which was attached to it by pivots, and formed to the natural shape of the velum and uvula. This instrument is said to have afforded all the advantages of the velum itself, although, as the author remarks, it is much less perfect than the one before mentioned.

“ The old method of supplying palatine defects by

means of soft substances, must necessarily have been attended with considerable inconvenience to the patient. They must have plugged up the nasal passages, and when distended by mucus, &c. must have been very offensive, if they were not frequently removed and cleansed. The use of sponge alone as an Obturateur, most likely gave rise to the sponge Obturateur with a plate, as described by Paré.

“ Although there have been so many improvements in these instruments, since their invention, it is somewhat remarkable, that Paré’s sponge Obturateur still continues in general use in this country, notwithstanding it is decidedly the most injurious and imperfect that can be employed. It is injurious, from the distended sponge pressing against the sides of the aperture, which are likewise continually irritated, and are often torn by the force used to withdraw it from the nasal passages that it may be cleansed,—a process which requires to be frequently repeated, otherwise it will become highly offensive and disagreeable to the patient. If a distended body be permitted to make pressure against the sides of the aperture, the beneficent intention of nature, which tends to a final cure, will be wholly retarded, and a contrary process will be exercised : the diameter of the cavity will in process of time become considerably in-

creased. All those artists who have attached themselves to the study of this subject, have doubtless seen this injurious tendency in the sponge Obturateur, and will perhaps agree, that it is an instrument that should be altogether discontinued.

“ Ambrose Paré appears to have been aware of its numerous imperfections, as he proposed his second instrument, with the movable blade, as an improvement upon the former. These blades could only have been used where the length of the aperture exceeded its breadth, and the exact thickness of the palate must first have been ascertained, otherwise the semi-circular turn could either not have been effected, or, if it were, the plate might be but loosely retained in the aperture. Various other impediments must have occasionally presented themselves, which would have rendered this instrument very unsuitable for the purpose; yet we find these Obturateurs to have been the only ones in general use for many years, until M. Pierre Fouchard projected his instrument with the movable wing, which was probably intended as an improvement on that of Paré; but as that so slightly obviated the defects of this instrument, it very soon fell into disuse, until he constructed his second instrument with vertical wings, which was found to do away with all the inconveniences of

the former. Having since undergone some improvements, it continues in general use among the French, and is the most perfect of winged Obturateurs. M. Fouchard appears to have taken up the subject in a much more scientific manner than any of his predecessors; his method of placing teeth upon his Obturateurs, and that of making these instruments of bone, was an invention which does not appear to have been previously known: his Treatise contains most minute, and at the same time interesting information, upon the subject before us, both as to the adapting of these instruments and their construction.

“ The ingenious Bourdet entertained different views upon the subject of Obturateurs, from those of his predecessors: observing the disposition there is in the parts to close, he very justly considered the importance of constructing an Obturateur that should not act in any way to impede this operation; this he accomplished in his juxta-position plates, which were attached round the teeth. By this adaption every opportunity is given to facilitate the natural coalescence of the parts, and it is certainly one of the most scientific improvements that has been published. M. Fouchard’s toothed Obturateur is merely an improvement upon the two instruments before mentioned; the bands by which it was held in its position, were made to press

against the inside of the teeth, without a counter resistance : this was ill conceived, as the constant force in one direction would be most likely to injure materially those teeth which maintained the pressure. M. Dubois Foucou's instruments for supplying a portion of the velum, would not be found so suitable for a perforation through that organ, as in a deficiency of any distinct portion of its posterior substance : from the nature of its construction, it would not keep the aperture closed under all the varied motions of the soft palate ; but the formation of the springs is an original idea, which may be very usefully applied in the construction of other Obturateurs.

“ No instrument appears to possess so much mechanical skill and ingenuity as the complete palate of M. de la Barre, but he does not inform us by what means it is retained in its position ; his other, for the supply of the soft palate, is, in many respects, incomplete. He directs that the Indian rubber should be rendered thin by powerful pressure in warm water. We are well aware, that however much elastic gum may be pressed thin in warm water only, it will not retain its shape, and it will be found, that very shortly after it is placed in the mouth, it will return nearly to its former shape ; the lateral edges of this instrument do not appear to be well adapted to guard against friction, which,

if ever so slight, is known to produce great inconvenience. M. de la Barre remarks, when describing this instrument, that, ‘ it is much less perfect than that which is adapted to the palate, which is furnished with teeth, &c.’

“ In the case of a young lady, whose parents objected to a surgical operation, Mr. Snell was induced to try how far success might be obtained by mechanical means. With this view, he obtained a correct model of the deficiency, from which a gold plate was formed to fit the roof of the mouth, reaching as far back as could be worn by the patient; to the posterior part of which two pieces or flaps of Indian rubber were attached, thus filling up the deficiency of the soft palate. A small movable piece of the same material was also attached, by means of a gold hinge, to the centre of the lower piece, to imitate, as near as possible, the natural uvula. A piece of ivory was next fitted to the upper or back part of the gold plate, and carried upwards until it came in contact with the remaining part of the septum narium: this was, of course, firmly attached. The whole was held in its situation by means of two gold springs soldered to the plate, which were fixed round one of the molares on each side.

“ It may readily be supposed that the introduction of such an apparatus would, in the first instance,

cause great inconvenience. This was, however, overcome by perseverance on the part of the patient, who soon experienced a most material improvement in her speech, as well as great increase of comfort while taking her meals; and the parents were most unexpectedly and agreeably surprised to find her possessed of considerable musical power, —a qualification which none could have presumed to hope for. As the apparatus required to be frequently removed, that it might be cleansed, she was provided with two, the exact counterpart of each other.

“ By making a variety of experiments, Mr. Snell has been led to considerable improvements in this useful instrument, hitherto, in many respects, defective. The bone-piece is now substituted by gold plate, and the elastic gum velum and uvula are considerably improved, by a spring being affixed behind them, which admits of their partaking of the movements of the natural parts. His present method of constructing it is as follows:—A gold plate should be accurately fitted to the roof of the mouth, extending backwards to the palate bone or extremity of the hard palate, a part of the plate being carried through the fissure, about an inch in length. To that part of the plate, which answers to the nasal passages, should be soldered two plates, meeting in the centre, and carried upwards

through the fissure to the top of the remaining portion of the vomer, to which it should be exactly adapted, at the same time being made to the natural shape of the nasal palatine floor: thus the fluid of the nose will be carried directly backward into the fauces. A piece of prepared elastic gum should next be attached to the posterior part of the plate, where the natural soft palate commences, extending downwards on each side, as low as the remaining part of the uvula, and grooved at its lateral edges, to receive the fissured portions of the velum. In the posterior centre of the elastic gum, should be placed a movable uvula. That these may partake of the natural movements of the parts during deglutition, a spring should be affixed behind them, one end of which should be fastened to the posterior and anterior surface of the principal plate, while the other end rests gently against the posterior face of the Indian rubber, which keeps it always in close apposition with the edges of the fissure during deglutition, &c. The anterior lateral edges of the Indian rubber should be made to come considerably over the sides of the fissure, which will prevent it from slipping behind it during its altered position, the whole apparatus being held up, as before described, by elastic gold springs fixed round the teeth on each side.

“ Imperfections of this kind from birth, are fre-

quently attended with a deficiency of one or more of the front teeth, and combined with hare lip. Two cases of this description came under Mr. Snell's care, one of which was supplied in the following manner:—An instrument was constructed similar to the one before described, only that the anterior portion of the plate was brought forward into the cavity between the teeth, two of which were deficient. A piece of sea-horse tooth was next fitted down upon this portion of the plate, shaped similar to the natural parts, and made to receive two natural incisors. The fissure in the lip was then supplied by a gold plate, formed to the natural shape of the parts, and enamelled so as to resemble the adjoining parts in colour. This was held in its proper situation by gold pivots, which were inserted into the piece of sea-horse tooth, so that it could be removed at pleasure. The patient was too timid to submit to the operation for hare lip, which of course would have been far preferable to any artificial supply."

ACCENT AND PRONUNCIATION.

Accent relates to the pronunciation of certain words taken singly; and as words justly pronounced are the materials of both delivery and singing, this must be carefully studied and acquired before they can be arranged or displayed

to advantage in succession. Pronunciation, in the modern acceptation of the term, is limited to the mode of enunciating certain words and syllables. Accent is understood either to mean the stress laid on particular syllables, or, in a more extended sense, the distinguishing tone or expressions of voice with which whole sentences are delivered. The pronunciation of words and syllables relates to written language, and to the ordinary combinations of letters, and is generally regulated by the analogies of the language; but custom sometimes, with most arbitrary authority, contradicts those analogies, and determines according to the pleasure of the ear, in opposition to the artificial standard of written language. No sounds indeed can be irregular, but with reference to such artificial standard; and the irregularity is truly not in the sound, but in the subject of adjusting the orthography according to that sound which the ear is pleased to adopt. But whatever may be the cause of the irregularity, every person who would speak or write a language with propriety must submit to it; and hence it is, that languages cannot, in respect to their pronunciation, be learned entirely from books, nor be judged with respect to their harmony from the dead letter. This knowledge is to be acquired only by conversing with correct speakers.

Pronunciation varies with the modes and fashions of the times, as does also the whole language: it is sometimes so fluctuating in particular words, and high authorities are often so much at variance, that the most correct mode is hard to be determined. Accent is also subject to the caprice of fashion. Ancient writers accented many words differently from the moderns: and not many years since, the tide of innovation tended to throw the accent as far backward as possible, even on words which by that alteration were rendered altogether difficult to pronounce. And it may be remembered that exertions were made to bring into vogue such uncouth accentuations as *comparative* and *imperative*; and that they nearly succeeded. *Miscellany* is one of those words which has retained its new accent. It is incumbent on literary men to resist such innovations as violate the prosody and destroy the harmony of the language, and render obsolete the measures of our best poets, which would otherwise remain as a fixed standard of both.

The effect of the accent on English syllables is either to lengthen or shorten their quantity. When the accent is placed on the vowel, the syllable is uniformly long, as *glóry*, *fáther*: when placed on the consonant, if it be mute, the syllable will be short, as *bat'tle*, *hab'it*; if it be a

liquid, the syllable will be long. But besides this literary accent, marked in written language, there is also an accent relating to the tones and expressions of the living voice, and understood as the general rhythm, or recitative, in which whole sentences are delivered: this is named the provincial accent. It is the peculiar rhythm of each country or province; and, according to the law of language established in every capital city, it is a stain of rusticity and an object of censure; and must be guarded against or removed by every one who would not incur the penalty of being uncourtly.

It is altogether unpardonable to err against the articulation, the pronunciation, or accenting of particular words, because every literary man may acquire sufficient information on this subject, partly from books, and partly from living authorities. But as to the general rhythm or recitative of his speech, almost every man is compelled to fall into that of the majority of those with whom he converses; and whoever does not reside at the very Court of London, Versailles, or Madrid, or live with the highest class of persons who form it, must speak more or less with a provincial accent. Even in London (in this sense of the term) the accent of the citizen differs from that of the courtier; and every province in Eng-

land has a peculiar accent of its own. Nor is this a peculiarity of the English language; in all countries there will be perceived a recitative or rhythm, which distinguishes the nearest neighbours from each other, notwithstanding that they speak the same language, and speak it in the same idiom. But this unavoidable provincial accent, when not altogether rude and exaggerated by the sound of rusticity, when free from the most offensive peculiarities, and from those violations of the established rules and analogies of the languages, which disgrace any man of liberal appearance, meets with every indulgence: and whilst it is easily discovered that the person who speaks is either a native of North Britain, or Ireland, or of the counties in the east or west of England—circumstances in themselves which bring neither honour nor disgrace,—it will be equally manifest whether the speaker uses the language and possesses the manners of the gentleman and of the man of letters, recognized as such in the cultivated society of Europe at large.

The study of our own language is a very important branch of elegant knowledge, and no attention should be spared in order to improve in it as far as possible. But it appears to us, that a man of letters should set a higher value on every other power of his language, and be more

solicitous to acquire any of them, in preference to that superficial cant, which strikes the ear as the tone of the Court, and which is so commonly and so easily affected by the most illiterate. For this desirable object, the works of Dr. Johnson, Messrs. Sheridan, Nares, Walker, and other eminent writers, should be carefully studied; and the true sounds of the various combinations of the letters, according to the analogies of the language, be derived from the authorities of these masters, compared with the living authorities of the best speakers. To those who live with the Court of London, this study is obviously unnecessary; but such is the rigid uniformity required in the use of the English language, that to others it is indispensable, as no variety of dialect is tolerated,—an easy severity to be submitted to, and not to be complained of, and which is limited to the law of language only.

It is the custom, says Mr. Walker, not only of England, but of other parts of the world which are seats of empire, to call those modes of pronunciation, used in parts distant from the capital, by the name of accent. Thus we say, a native of Ireland speaks English with the Irish, and a native of Scotland with the Scotch, accent; though both these speakers pronounce every word with the accent on the very

same syllable as the English. Why then do we say they speak with different accents? One reason is, that speaking sounds have never been sufficiently analysed to enable us to discover their component parts, which makes us take up with indefinite and unspecific terms, instead of such as are precise and appropriated to their object. This has greatly obscured the notions of accent, and led Mr. Sheridan to suppose, that accent in our language is no more than a force upon certain syllables of a word, which distinguishes it from the rest; but that accent has no reference to inflexions of voice, and for that reason the word is used by us in the singular number. Others have imagined, that we have two accents, the grave and the acute; but, in the definition of these, they seem only to mean that the latter has a greater degree of force than the former: thus, for want of the simple distinction of the rising and falling slide of the voice, with which every accented syllable must necessarily be pronounced, the nature of our own accent seems as obscure, and as little understood, as that of the Greeks and Romans, and it is to this obscurity we owe the supposed impropriety of calling a dialect by the name of accent; for, though there are other differences in the Scotch and Irish pronunciation of English besides this, it is to the

difference of accent that the chief diversity is owing. If we understand accent only as force or stress, there is the slightest difference imaginable; since, in both these kingdoms, the stress is (with the exception of a very few words indeed) laid on the syllable as in England; and, for this reason, the laws of poetry are exactly the same in all: but if we divide accent into the stress, with the rising and with the falling inflexion, we shall thus see the propriety of saying, “such a one speaks with the Scotch or Irish accent;” for though the Irish place the stress precisely on the same syllable as the English, it is with a different inflexion; and the same may be said of the Scotch. Thus the Scotch pronounce the far greater part of their words with the acute accent, or rising inflexion, and the Irish as constantly make use of the grave accent, or falling inflexion, while the English observe pretty nearly a due mixture of each. If we pronounce a sentence in these three different modes, it may, perhaps, suggest to the ear the truth of the foregoing observations.

Scotch.

Exercise and t  mperance str  ngthen the constitution.

Irish.

Exercise and t  mperance str  ngthen the constitution.

English.

Exercise and t  mperance strengthen the constitution.

If these observations be just, the Irish ought to habituate themselves to a more frequent use of the rising inflexion, and the Scotch to the falling, in order to acquire what is not (from this view of the subject) improperly called the English accent.

EMPHASIS.

In all written and spoken language, there is generally in every sentence or expression of thought, some one word which relates to the predominant idea in the speaker's mind, and which, in the utterance, is properly distinguished by a peculiar stress of the voice, called emphasis. Emphasis discharges in sentences, the same kind of office that accent does in words. As accent dignifies the syllable on which it is laid, and makes it more distinguished by the ear than the rest, so emphasis ennobles the word to which it belongs, and presents it in a stronger light to the understanding. The necessity of observing propriety of emphasis is so great, that the true meaning of words cannot be always conveyed without it. For the same individual words, ranged in the same order, may have several dif-

ferent meanings, according to the placing of the emphasis.

In writing, the emphatical words are marked by a dash underneath; in printing, they are expressed by different types, which are generally *Italics*, but sometimes, when more is to be marked, capitals are used. Emphasis, in speaking, should not be too studiously urged, as it gives an air of quaintness or affectation. Many dashes in writing, or changes of character in printing, are equally bad; for in a good composition, the predominant ideas will start forward of themselves, without this artifice; and when the occasions really require it, they will be distinguished with greater effect.

From this, it will readily appear of how much consequence it is to readers and speakers not to be mistaken in it. The necessity, says Mr. Walker, of distinguishing the emphatical words from the unemphatical, has made writers on this subject extremely solicitous to give such rules for placing the emphasis, as may in some measure facilitate this difficult part of elocution: but few have gone farther than to tell us, that we must place the emphasis on that word in reading, which we should make emphatical in speaking; and though the importance of emphasis be insisted on with the utmost force and elegance of language, no assistance is given us to determine which is

the emphatic word, where several appear equally emphatical; nor have we any rule to distinguish between those words which have a greater, and those which have a less degree of stress: the sense of the author is the sole direction we are referred to, and all is left to the taste and understanding of the reader.

One writer distinguishes the increased force of the voice into emphasis of force, and emphasis of sense. Emphasis of force, he tells us, is that stress we lay upon almost every significant word; emphasis of sense, is that stress we lay upon one or two particular words, which distinguishes them from all the rest in the sentence. The former is variable, according to the conception and taste of the reader, and cannot be reduced to any certain rule: the latter is determined by the sense of the author, and is always fixed and invariable. This distinction, it must be owned, is, in general, a very just one; and a want of attending to it has occasioned great confusion in this subject, even among our best writers. They perceived, that besides those words which were strongly emphatical, there were many others that had a stress greatly superior to the particles, and less significant words; and these they jumbled together under the general term emphasis. Thus, when the emphatical words were to be

marked by being printed in a different character, we find, in several of the modern productions on the art of reading, that sometimes more than half of the words are printed in Italics, and considered as equally emphatical. To this distinction of emphasis Mr. Walker adds another, making a distinction of each into two kinds, according to the inflexions of the voice they adopt; which, though of the utmost importance in conveying a just idea of emphasis, has never been noticed by any of our writers on the subject. This distinction of emphasis arises naturally from his observation already laid down above, on the rising inflexion; and he presumed, that the utility of attending to the inflexions, when applied to emphasis, would appear no less evident and unquestionable.

On these principles, Mr. Walker gives the following definitions: Emphasis, when applied to particular words, is that stress which we lay on words that are in contra-distinction to other words, either expressed or understood. And hence will follow this general rule: Wherever there is contra-distinction in the sense of the words, there ought to be emphasis in the pronunciation of them; the converse of this being equally true,—wherever we place emphasis, we suggest the idea of contra-distinction.

According to these remarks we may observe, that all words are pronounced either with emphatic force, accented force, or unaccented force: this last kind of force we may call by the name of feebleness; or in other words, where the words are in contra-distinction to other words, or to some sense implied, we may call them emphatic; where they denote contra-distinction, and yet are more important than the particles, we may call them accented; and the particles and lesser words, we may call unaccented or feeble; for if we observe the pronunciation of these latter words, we shall find that they have exactly the same feebleness as the unaccented syllables of a word whose accented syllable is pronounced with some degree of force: we shall see likewise, that an accented word, which has a degree of force, when compared with unaccented words, when it is joined with an emphatic one, and pronounced immediately before or after it, sinks into feebleness equal to the unaccented words; and that the unaccented syllable, even of an emphatic word, is pronounced with as much less force than the accented syllable, as the unaccented syllables of an accented word are less forcible than the accented syllable of an emphatic word.

ACCENT AND EMPHASIS IN SINGING.

The warbling of sounds, says Dr. Kitchiner, in his *Housekeeper's Ledger*,* without the distinct articulation of words pronounced with proper accent and proper emphasis, does not deserve to be called singing: it is merely playing upon the voice—"A concerto on the larynx"—and as comparatively interesting, as a frame without a picture. Briefly, the art of singing effectively is to sing every word with exactly the same accent and emphasis as you would speak it.

When the singer does not affect to be inarticulate, this fault is more frequently either in the composer, or the writer. It is the fault of the composer, when, in adopting his notes, he neglects the preservation of the due emphasis to be placed on the words, and the proper accent and length of the syllables. It is the fault of the writer, when the numbers of his verse do not flow in regular succession. The composer sometimes wants a poetical ear as much as the writer does a musical one; and it is very seldom that either of them are capable of reading or declaiming with tolerable propriety.

* Rather an odd work for such remarks; but the Doctor is in the practice of such things.

A dancing-master, who should not be able to stand or walk, would doubtless be a droll professor of his art; and yet we have singers, singing-masters, and composers of vocal music, who are much in the same circumstances with regard to their own profession: that is, they cannot either read or speak. How far persons so qualified are likely to display the union of musical and poetical harmony, we presume not to determine.

The reciprocating power, says Mr. Bacon, which sentiment and sound have of aiding each other, should be made the constant object of study. It frequently happens, that a singer, either from his peculiar talents, or the composition itself, will have the means of transferring the delight from the words to the music, or *vice versâ*. The knowledge of this power is often the most useful in raising a weak passage, and art can never be more safely or better demonstrated, than in manifesting such a modification of expression, and in preserving an interest throughout the whole of a composition, as far as it is possible. The idea of throwing one part into shade, in order to give another a stronger light, appears to be erroneous. Every part should return as much interest as possible; for certain passages must give a stronger incitement to the mind than others, and it follows

that it is a capital mark of accomplishment not to permit any part of the performance to languish.

Sometimes, however, good emphasis in reading or declaiming will be found to vary from good emphasis. Melody receives an accentuation from its particular measure, which is unknown to the speaker. Prose has none of this; and even poetry, when well read, submits to little of fixed accent. In music, the accent which recurs with certain parts of the bar, must more or less interrupt the emphasis upon the words. It is not only from their importance in the sentence, but their position in the bar, that words become emphatic; and however the best composers have been led to consider and avoid this objection in their works, such instances are so common among all masters, that they can hardly be considered exceptions to a rule, but rather a radical and necessary defect, so far as regards the matter of which we are treating, in the union of words and music.

A singer will often find that by the judicious use of the finest notes in his compass, he can aid the effect both of the sentiment and the music. He may therefore constantly avail himself of this knowledge, to pause or swell, or diminish the tone more particularly upon those notes, than upon others less perfect, where it does not interfere with the peculiar importance of the sentence, or the time of the music.

The best method, perhaps, is first to consider the appropriate delivery of the words before he tries them, in combination with the air. Having thus determined how the words ought to be read, he will proceed in the adaptation of them to the melody. The first difficulty to be encountered is the synchronous delivery of the words and the notes; for if the syllable expire before the termination of the note, he will be under the necessity of substituting some letter or syllable, which never fails to introduce a vitiated tone, as well as impurity of speech. The greatest attention is necessary to this point, for the tone is not alone in danger. A too sudden or too great change in the aperture of the mouth or lips, will affect the intonation also; and there is nothing more difficult than to preserve the tone pure, and the tune perfect, under the various changes which the different vowels and the different motions produce. Whenever a syllable is prolonged through a division, the nicest regard should be paid to the vowel upon which the pronunciation of the syllable depends. The slightest deviation is felt: the *e* is always liable to degenerate into *a*, the *a* into *o*, and *i* into *e*. A very minute change in the mouth effects this: the master (or in his absence, the student himself) must watch the syllable most carefully, and stop on the instant; the evil consequences of a bad

habit, in this or any other respect, are rarely eradicated, as is to be perceived more strongly in an English singer accustomed to sing Italian.

It is justly remarked in the Literary Gazette, that the pupils of our excellent English composer, Dr. Arne, were remarkable for their attention to accent and pronunciation. It will be thought almost incredible, that all the fine and clear pronunciation of the words which distinguished the late Mr. Kennedy, natural as it appeared, was the entire effect of hard up-hill application of the Doctor's lofty conceptions of what was calculated to touch the hearts and understandings of the auditors. This immense difficulty was often accompanied by tears and sobbings, as impossibilities; but Arne knew otherwise, and *omne tulit punctum*. It is indeed inconceivable, what lights the Doctor threw on the accentuation of each word—nay, on every letter of every word, whether commencing or finishing with either vowels or consonants, so as to render the sense of the song intelligible to the most common ears as well as to the most refined. He would pass whole mornings, and never give up the idea that the poetry of a song ill-expressed was a nullity to the understanding, instead of a blaze of light; and thus he succeeded with the British public.

The facetious and versatile Dr. Kitchiner has

well exemplified the preceding principles in his directions for singing our national anthem—"God save the King," with good emphasis and good discretion ; and, as he elsewhere remarks, "it is no matter how good your meat is, if it is not well dressed." The words, says the Doctor, being marked with proper emphasis, it is presumed will infinitely heighten the effect, and may be a standard for the performance of it, and ensure the proper pronounciation of the words, and the effective expression of the music ; and revive that harmonious combination of them, the want of which has long been deplored by all who have faculties to comprehend how great is their power when united, and

" Sound is married to immortal verse."

As soon as this is generally considered, singers will see that their readiest road to fame is to avail themselves of the double power of making the words an appeal to the hearts and understandings of their auditors—as well as attacking their ears with volutas and cadences, &c. To produce effect on others, actors must themselves feel the passion they wish to inspire their audience with—and to sing with proper and effective expression, must give to every syllable and to every quaver its exact relative value ; but not shout and bawl upon *From—To—Of—In—And—But—On*, &c. merely

because they happen to be placed (improperly) under the accented part of the bar, or under a long note,—or a favourite note in their voice. In singing, “God save the King,” if every syllable be sung, as it commonly is,

“Gōd sâve grēāt Gēōrge ōūr Kīng,”

these words are pronounced as if they were spelt—

Gaw-od say-eev grey-eat Jaw-orge ow-er Kee-ing ;

thus making monosyllables into dissyllables.

If the proper pronunciation be preserved, it must be thus—

Gōd ! sâve great Gēōrge our King.

The only syllables in this line which should be long, the time indicated by the notes, are—Gōd sâve—and—Gēōrge.

This solemn invocation to the Almighty, as commonly sung, sounds more like a song of triumph, than a prayer for the preservation of the sovereign—hardly a word of it except the first and last line is heard distinctly. How much would the effect of this loyal anthem be increased, if the name of God were uttered with due reverence ; and if singers would consider, that “God save the King” is not a florid song, but an anthem, and, like other anthems, admits of hardly any ornament beyond an apogiatura !—

“Sing ye praises with understanding.”

Psalm xlvii. 7.

Instead of vying with each other who shall introduce most trills, shakes, &c. let us try who can most distinctly articulate every syllable, and most effectively utter every word.

The loyal anthem is not a singular example of the want of the coincidence of the musical and the prosodaical accent. It is almost impossible to point out a song, that can be sung exactly as it is set down, from this want of the coincidence of the rhythm of the poetry and the music,—which it is no easy task, even to singers of superior ability, to adjust perfectly, so as to give full effect to the poetry, and, at the same time, preserve the melody.

Rousseau, in his Dictionary of Music, speaks of a musical accent to which all others are subordinate, and which must be first consulted, to give an agreeable melody to an air. It is singular that he does not at the same time give any means of recognising it, and of observing its rules. We have asked, says M. Suard, several great composers, both national and foreign, what they understood by musical accent, and if the expression belonged to the language of the art. Some of them have answered, that they could attach no precise idea to the term, while others explained it with great differences of meaning. In the best Italian works written upon music, such as those of Zarlino, Doni, Tartini, Sacchi, Eximeno, &c.

it is rarely found but in discrepant acceptations. The term, therefore, does not appear to be determined or generally acknowledged by the learned in the art. It may be necessary, however, to try to fix its meaning more particularly, to avoid confusion and inaccuracy.

Accent, continues M. Suard, being in discourse a more marked modification of the voice, to give to the syllable over which it is placed a particular energy, either by the force or duration of the sound, as in the Italian and English languages, or by a perceptible grave or acute intonation, as in the Greek and Latin tongues; it needs only to apply to music the general ideas which this word presents in grammar. The musical accent, then, will be a more distinct energy attached to a particular note in the measure, the rhythm, or the phrase of the music, whether in articulating this note more strongly, or with a gradual force; in giving it a greater duration in time; in detaching it from others by a very distinct grave or acute intonation.

These several varieties of musical accent belong to pure melody; others may be drawn from harmony. The first variety is the essence of music in all fixed and regular measures. Suppose, for example, twenty-four successive notes, of equal value, following each other: if these

be sung or played upon an instrument with an equal force of sound, as they have all an equal duration, you will have only a distinct succession of similar tones, but entirely destitute of any appearance of time. These will not constitute music. Should you wish to give them a fixed measure, you will be obliged to mark by a more forcible articulation the note which begins each bar: for instance, if there should be four-and-twenty crotchets, and you wish to give them a measure of four time, you must strike more strongly the first, the fifth, the ninth, and so on. For the measure of three time, you must strike the first, the fourth, the seventh, &c., with more energy; and for the measure of two, every other note must be struck.

Now this is precisely what every singer naturally does,—the notes more forcibly given, being the strong parts of the measure, and the others the weak parts, or, in technical language, the perfect and imperfect times of the bar or the parts accented and not accented. In the measure of four time, there are two strong parts and two weak, for the third is marked less strongly than the first, but more so than the second or the fourth. There is, consequently, a constant musical accent in all pieces of measured music; for it ought to exist, although by the movement of the rhythm, or the

effects of expression, this accent is contradicted or almost effaced by an accent of another kind.

Again, if in each bar, or in two or three following bars, &c., the same note, or a longer note than the others, return regularly at the same part of the bar, this note would be considered as a musical accent, giving a particular effect to the melody. Also, if in the same way, at certain parts of the measure, or the musical phrase, the melody be regularly raised or lowered by a marked interval, this intonation would form a very distinct accent.

In the case of harmony, if the different voices or instruments strike more forcibly a certain part of the bar or musical phrase, or if a larger number of voices unite to strike the same part, there will be an accent on the note. Besides, there will be one upon the note which is struck at regular intervals by a marked dissonance, or by an abrupt passage in the melody. There must, of course, be a very great variety of musical accent, which can only be learned and mastered by accurate observation and careful execution.

PAUSES AND BREATHING.

It is important, both in speaking and singing, to keep the lungs always in a certain degree inflated, so that the voice shall not at any time be

run out of breath. The air also which is necessarily expended, must be gradually and insensibly recovered at the proper times, and in the proper places, corresponding as much as possible with the natural pauses; though, as Quintilian observes, pauses may often be made without taking breath; for example, when a sentence consists of many members, the sense of which is presented separately to the imagination.

It is almost unnecessary to remark, that the common pauses requisite to be made according to the rules of punctuation are so obvious, that a reader or speaker in public must be very careless who offends against them. If such a violation at any time happen, the speaker betrays such ignorance of his subject, that he gives evidence against himself, proving that the composition which he delivers is not his own, and, therefore, he loses all influence with his hearers. The violation of pauses, in consequence of being run out of breath, is nearly as injurious and disgraceful to the public speaker. The lungs of all men are not equally capable of supporting the labour of exertion, but by due attention, and proper management, every one may avoid this inability, which is equally painful to the hearers and himself. Temperance and bodily exercise strengthen

the lungs; indolence and intemperance injure them. Frequent repletion bloats the body and oppresses the lungs.

The failure of the breath sometimes arises from the injudicious management of it; as when the speaker has given himself a habit of exhausting his lungs, at the close of every sentence; nothing can be more injurious. The lungs must be kept inflated, like the bellows of an organ, and have a body of air always in reserve; so that the portion, which, in the delivery, is constantly given out, must be imperceptibly and constantly supplied. The speaker is not to put off this necessary supply till he arrive at a full period, and so run himself out of breath, if the sentence should be long; as any part of a sentence admitting a pause between its members, though ever so light, or any place admitting a momentary suspension of the voice, suffices for the recovery of small portions of the air which is thus expended.

This precept equally applies to singing as to public speaking, and it is considered as a point of the highest consequence in that to sustain the voice with equability: this can alone be effected by the management of the breath, and by seizing the proper opportunities for inspiration. In this beautiful point of art, the singers of Italy excel all others; and it is the true secret of that un-

broken flowing stream of voice, which is called the *sostenuto*, and which gives the power of swell and diminution of the volume; it regulates, in effect, the whole of their punctuation (if it may be so called), and constitutes the inimitable expression of Italian song.

The chief directions for the management of the breath in singing, are to fill the chest just before beginning a strain;—to take breath on the weak or unaccented part of a measure, and never at the beginning of a bar, or in the middle of a word;—to sing a single strain or musical phrase, if possible, in the same breath;—to prepare, by a deep inspiration, for a long passage or division;—and to take advantage of the opportunities short rests or pauses afford for inhaling and giving out breath as slowly as possible. These rules have exceptions, but they must be left to the knowledge, judgment, and experience of the singer, as they cannot well be described in words.

The ordinary pauses which are marked in writing, serve principally for grammatical discrimination. But in public speaking, pauses of a nature somewhat different are introduced; these may be termed rhetorical pauses, and require to be adjusted by correct judgment and feeling. They are placed either before or after important matters, in order to introduce or leave an im-

pression on the memory with stronger effect, by suspending the sense in an unusual manner, and in an unexpected place. They arrest the attention—they break the uniform flow of delivery, and operate by sudden change from sound to silence; something in the manner in which Locke observes, that “positive ideas are produced from privative causes. The abatement of any former motion must as necessarily produce a new sensation, as the variation or increase of it.”

But though the sound is to be interrupted in these pauses, the gesture and countenance must express that something further is to be expected. Rhetorical pauses thus contribute to the verisimilitude: the speaker appears full of his subject, and rather to wait for the expression; he appears to take time for reflection, to exercise thought, to doubt, to resolve, to be alarmed. When he speaks, after such pauses, judiciously made, he seems to utter the persuasions of his mind at the moment; he seems to speak as nature dictates; and makes, on that account, the stronger impression. For among the most powerful means of influence which oratory exerts, is the opinion which is entertained of the sincerity of the speaker; and that we think we are able to judge, when we are, as it were, taken into consultation in his reasonings, and show the inmost feelings of his heart.

On the stage, this power of persuading the evidence of the feelings constitutes the great perfection of the actor. Every movement of the mind is manifest, and we enter into all the situations and interest of the man. Garrick was eminently great in his power over the minds of his audience in this respect.

The reading of verse requires certain pauses, which differ, in some measure, from the pauses used in the reading of prose. The first is named, by Mr. Sheridan, the pause of suspension, or final pause, which takes place at the end of each line: in this pause, there is not to be any inflexion of the voice. The second is the cesural pause, which divides the verse into equal or unequal portions; upon the right management of which, the melody and harmony of versification in a great measure depend. The seats of the cesura most pleasing to the ear, are either at the end of the second foot, in the middle of the third, or at the end of the third foot; but it may occasionally take place in all parts of the line. Its place may be easily discovered by a good ear.

Mr. Sheridan's rules for reciting verse are the following:—All the words should be pronounced exactly in the same way as in prose. The movement of the voice should be from accent to accent, laying no stress on the intermediate syllables. There

should be the same observation of emphatic syllables as in prose. The pauses relative to the sense only are to be observed in the same manner as in prose; but particular attention must be given to those two peculiar to verse, the cesural and final, as before described, which he calls musical pauses.

The usual fault of introducing sing-song notes, or a species of chanting, into poetical numbers, is disagreeable to every ear but that of the chanter himself. Such readers, indeed, seem generally in high raptures with their own music; for, according to the old observation, *Haud cuiquam injucunda quæ cantat ipse*:—i. e. No man's time is unpleasing to himself. But they ought to consider that they are doing great injustice to the poet's music, when they substitute their own in its room. The tune of the poet can then only be heard, when his verses are recited with such notes of the voice as result from sentiments, and a due proportion of time observed in the feet and pauses, the constituent parts of verse.

There does not appear to be any necessity for attending particularly to this pause, as the harmony of the versification, and the very cadence of the line, render it inevitable. It seems to us more necessary to be guarded against than insisted upon, especially when the sense does not terminate with the line. In French tragedy, the versification of

which, from the uniform place of the cesural pause, is monotonous, the author and actor both seem to use every contrivance to avoid the disagreeable recurrence of the final pause.

The author frequently makes the sense close in the middle of the line, and breaks a line between two interlocutors. The actor violates even a full period, and makes no pause till he has run into the beginning of the next sentence. This, at least, was formerly the manner of the French actors, and nothing could be attended with a more unpleasant effect.—See Voltaire for examples.

He is always considered as a good reader of rhymes, who in his recitation hardly suffers the hearer to perceive them. Why it should be requisite for the poet to produce what it is a merit in the reader to conceal, we know not;—it is something almost superfluous, like a late fashion of dress, of wearing fine lace-ruffles under the sleeve of a coat which very nearly covers them. The late Mr. Quin, and Garrick also, who was consummate in the science of enunciation, would have turned away with disgust or pity from the repeater of verses, who let them know that they were such by the mere rattling of the metrical faggot.

He faggoted his notions as they fell,
And if they rhymed and rattled, all was well.

DRYDEN.

VII.

FORMATION AND IMPROVEMENT OF
THE VOICE.

THE careful perusal of what we have said respecting cadences, transitions, tone, pitch, articulation, accent, emphasis, pauses and breathing, as also the varieties and qualities of the voice, will lead the reader to many useful and practical hints, for both forming and improving his voice, either for speaking or singing. Imitation, when it approaches to mimicry, must always be prohibited ; but when it is under strict regulation, and not carried too far, it is indispensable in the proper formation of the voice. Many indeed have not been aware of the powers of their own voices, till they were called forth by endeavouring to imitate others. Imitation, then, should only be used to assist in bringing out the best tones of the voice ; but there it should be abandoned, and independence be made the future guide.

CHOICE OF A MASTER.

THE first thing requisite for forming the voice, then, is to choose a good master, who shall both be able to set an example of excellence, to correct faults, and to draw forth the best tones of the voice. The ablest singers, says Tosi, should alone undertake the task of teaching, as they best know how to conduct the scholar from the first elements to perfection; for there is much difference between voicing with true taste, whether given by nature, or formed by art with an eye to nature, and mechanically playing as if they bore no relation to each other; and hence it is, that very few players can sing. Whoever be chosen as master, besides the knowledge of the art, it is requisite, says Tosi, that he be an honest man, diligent and experienced, without the defects of singing through the nose or in the throat, and that he have good command of voice, some glimpse of good taste, ability to make himself understood with ease, a perfect intonation, and a patience to endure the fatigue of a most tiresome employment. To give proof of his honesty, he should make a disinterested trial, whether his proposed pupil have a voice of the qualities suitable to what it is designed to execute, and then give due instruction, so that time and money may not be

unnecessarily thrown away. The instances, says Mr. Bacon, of young people who are misled by the partiality of friends are numberless, and often exceedingly ridiculous. I remember the late Dr. A. having been engaged in a correspondence with a lady in Ireland, who wished to be ushered into the musical world under his protection; and, according to her letter, Madame Mara could not be expected to surpass her;—she could sing every thing. The lady accordingly came to England; but, on hearing her sing, the Doctor, with his accustomed honesty, exclaimed, “Madam, you must go back to Ireland; for, by G—, unless you and I were shut up in a bandbox together, I could not hear you.” About the same time, a person who had lavished an enormous sum in Italy upon the musical education of his wife, brought her to Doctor A. for lessons. The Doctor very candidly told him, the lady had no ear, she sung too sharp, and nothing could be done. This was a severe stroke upon one who aspired to become Prima Donna at the Opera. The Doctor’s opinion was, however, verified by the public judgment, for she was advertised for Sadler’s Wells the ensuing winter.

SOL-FA-ING.

LET the master, says Tosi, never be tired in making the scholar sol-fa, as it is the only basis of

forming a good and correct mode of voicing. He should always make the scholar sing standing, that the voice may have free play, and not be obstructed by bending the head forward. At the same time, every ungraceful stiffness of position must be carefully avoided; and all grimaces and tricks, such as twisting the head or body, knitting the brows, distorting the mouth, or shaking the jaw, must be rigorously avoided or corrected. The mouth, in particular, must be attended to, and composed in a manner (if the sense of the words permit) rather inclined to a smile than to too much gravity.

A great lover of sacred music, after hearing, or rather seeing, an anthem sung, wittily remarked, "I should judge the person who sung the bass to be a barber." "Why?" asked his companion. "Because," says he, "the man tossed his head about, and *curled* his notes so much." To avoid, therefore, such bad habits and *curling* of notes, let the scholar practise for some time in a plain manner, studiously keeping out of sight the ornaments of singing till he be sufficiently prepared; for it is absolutely necessary that he learn to tread and walk, as it were, with the voice, before he attempt to move gracefully with lightness and air.

The master should carefully instruct the scholar how to open his mouth, that the voice, whether it be *di petto* or *di testa*, may always come forth pure

and clear, without any contamination by passing through the nose, from the fault of heaving back the tongue, or any interruption of the throat, from the fault of contracting the windpipe or the mouth or lips,—which are insufferable defects in a speaker or singer, and past all remedy if they once grow into a habit. In such cases, when the scholar has any defects of the nose, the throat, or the mouth, let him never sing but when his master is by, or somebody who understands the subject, in order to correct him; otherwise he will get an ill habit, which he may never afterwards be able to overcome. If the scholar begin right, he goes on right; but if in the first instance there be the slightest error, that error, to whatever degree it amounts, can be only removed by extraordinary labour, and even that is often unsuccessful.

It is of much importance, also, to proceed from the low to the high notes by degrees, and in perfect union, similar in some measure to a peal of bells—striking the lower firm, round, and full *di petto*, and the higher with proportionate softness, to avoid screaming and the danger of cracking, overbreaking, and ruining the voice. The higher tones, if not given by nature in a *soprano* and *contralto*, may be acquired very agreeably by art, *di testa*, from a proper management of the throat by narrowing the windpipe, somewhat similar to the

lesser pipes in an organ, or the pinching of the notes in a wind-instrument.

The master betrays great want of skill, who obliges the scholar to hold out with force on the highest notes ; the consequence of which may be not only injurious to the voice, but, as we shall afterwards see, to the health—tending to inflame the throat, burst some blood-vessel, or produce rupture, and the voice is certain to be impaired in beauty and flexibility. In sol-fa-ing, however, it will be advisable to protract every note as long as the breath can hold out without straining, as it is only by such exercise that particular notes of the voice that may be weak, can be strengthened and improved. Marchesi is reported to have devoted three entire years to the equalizing and perfecting, by such exercise, two notes of his voice.

The master should be diligent to discern where the full natural voice terminates, which, as we have already noticed, is generally in a male soprano at D or E, in a contralto at G, A, or B ; and thence to help the learner upwards, so as to unite the *false* with the *di* *petto*, that they may not be distinguished at their junction, either in ascending or descending the scale ; for, if the natural and the artificial notes do not perfectly unite, the lower, like the greater bell of a peal,

covering the next above it in equal proportion through the whole peal, the voice will be of different characters and disagreeable.

Every note, but particularly semi-breves and minims, must be struck plain and firm, like (if we may use the comparison) one who walks and marches well with his foot set even on the ground, and lifted up without any shuffling and stamping. For this purpose it may be right, at one time, to strike the notes smartly and fully, then to take the voice off immediately; or, as Tosi says, let the singer not omit frequently to put forth his voice and stop it, so that he may learn to have it always at command. At another time, let him continue every note a semi-breve or longer—then for a minim, crotchet, quaver, &c., full, but without any swell from low, and equally soft with the high notes, after having collected the breath, by inflating the breast, and letting the breath gradually out again, as we have before taught.

By such management, a good natural voice of any kind will charm, and an indifferent voice may be made agreeable. In every voice there are some naturally good tones, generally about the middle; and perhaps, in forming the voice, it is best to begin there. Carefully attend, then, to any one naturally good tone, and the manner

in which it is produced ; taking this for a pattern, and descending, form by it first each note firm and full *di petto*, as low as art can improve upon nature ; for notes may be gained by art *di petto* as well as *falsetto*, especially in a *soprano* or *contralto* voice. Afterwards, upon the foundation firmly laid, raise the upper part of the voice into one uniform and beautiful character. The effects of this exercise, when properly persevered in, are often astonishing. “I have known,” says Mr. Bacon, “very singular instances in private life ; but never, that I remember, so striking and extraordinary advancement as in Mr. Phillips, who was some time since at Covent-garden Theatre. This gentleman, when he first intended to make music his profession, applied to Dr. Arnold, from whom he received some instructions. He soon after was engaged at the Norwich Theatre, where he was distinguished by his very florid use of ornament. His voice was then a mere thread, and absolutely without a particle of what could be called tone. His industry and perseverance, however, were astonishing, and they have led him to the very respectable situation he now enjoys. After an interval of some years I heard him with amazement, scarcely being able to bring myself to believe it was the same individual.”

The master should also teach the manner of putting forth the voice in the manner of a swell, called by the Italians *messa di voce* (an expression borrowed from high mass), which is formed by giving strength to the voice, gradually from *piano* to *forte*, but steadily without any shaking or trembling; and from loud to return, with the same gradation, to soft. Some have not unaptly likened this to the shape of a barley-corn, an egg, or any other elliptical figure pointed at the ends and broad in the middle. In producing this, the nicest attention must be given to the accuracy of the intonation, as well as to the quality of the tone. If the note be taken too flat or too sharp, in the most minute degree, or lose the pitch in the course of increasing or diminishing the tone, the pupil should not be suffered to proceed for an instant, but be stopped and made to hit the pitch precisely.

A beautiful *messa di voce*, from a singer that uses it sparingly, and only on the open vowels, can never fail of having an exquisite effect; inso-much that it might be considered as more than a requisite—one of the ornaments in singing,—an excellence borrowed from the throat of the nightingale. In this respect, however, it may rather be placed among the requisites:—that it will prevent a frequent and very bad effect—that

of pushing the voice, and driving it, as it were, with a kind of jerk, into a sudden and boisterous loudness, or letting it drop into an extreme softness. A smooth, easy, and even delivery of the voice, is one very great, if not the greatest, excellence in singing, and must therefore be carefully studied.

By taking breath, and supporting the tone, as we have directed, will be prevented the too common fault which beginners are liable to—of relaxing the voice into a fluttering, trembling motion, after the manner of all those who have no command of the voice, and sing in very bad taste; for it may be remarked, that there can be no command of the voice without a perfect command of the breath. This, therefore, should be gained by learning to draw up the breath quick, and without the least noise, fully into the chest or lungs, after the manner of holding the breath, and letting as little expire at a time as possible: sufficient breath should be particularly taken before a cadenza. Nothing in such cases is more important, particularly to beginners, than to avoid irritating the lungs and organs of the voice, by too long continued practice at one time. Short intervals of exercise—half an hour at the utmost, should be tried at first, and their duration gradually increased, if necessary, as strength

is acquired. Inaccurate voicing and false intonation often proceed from fatigue; and it ought never to be forgotten that habit is powerful, and will often prevail over natural imperfections.

To acquire a long breath and strengthen the lungs, there cannot perhaps be a better method than to run often up some steep ascent, especially in the morning; beginning leisurely at first, and accelerating the motion near the summit, without suffering (if possible) the lungs to play quick or pant either during the exercise or afterwards. Next to this, temperance, particularly in the use of malt liquors, is beneficial; and carefully avoiding all sudden heats or colds, which may occasion hoarseness. Under such management of the voice and breath, moderate singing is rather beneficial than injurious to the constitution, even of those who are but tender and nervous.

When the pupil has been sufficiently exercised on the simple scale by sol-fa-ing, he may then proceed to sing upon the vowels, diphthongs, consonants, and words. As all vocal sounds, and of course the tones in singing, are formed with vowels, so the scholar ought to be carefully taught to pronounce them plainly, with the throat and mouth properly open, and the lips shaped according to the nature of the vowels, that the

tones may proceed freely, and the vowels be heard distinctly, as in speaking. The open vowels suit best the tones *di petto*; the narrow, those *di testa*. This should be remembered by the composer as well as the singer, who is often put to difficulties by notes of length at the upper part of the voice. From this the singer, in order to relieve himself, must have recourse to art, either not continuing the notes the whole time, or slurring up to them; or narrowing the open vowel, if he would preserve agreeably the tones of his voice.

The tone in diphthongs should be thrown chiefly on the most open vowel, as on *a* in *praise*, *o* in *out* and *joy*; yet so that both vowels may be heard, by closing with the narrow vowel in all diphthongs ending with it, the instant the tone or note is finished. But the narrow vowel in the beginning of diphthongs, as *e* in *hear*, *a* in *fair*, and changed into *i* short, must be just heard by instantaneously opening with it, and the tone prevail on *a* changed into *u* very short. In this manner likewise should every consonant be pronounced by a quick motion of the breath and tongue, without the least interruption of the tone.

The vowel, which before a final consonant is often quiescent, or nearly so, in speaking, such

as *e* in *open*, *humble*, *loved*, ought to be gently heard in singing, for the sake of rendering the following consonant more liquid, which is more particularly necessary in the nasal and hissing consonants. The rough consonant *r*, the gutturals *g* and *gh*, ought also to be rendered as liquid as possible in singing. In order to gain a perfect pronunciation, which is of so much importance, it may be proper to exercise the pupil at first upon the simple vowels, and proceed by degrees to consonants and words, in a similiar manner to the process pursued in teaching children to spell and read.

Those who are inattentive to these rules sing with affectation, as if ashamed to open their mouths; and, therefore, they may be considered as still in their first lessons, giving the second vowel of a diphthong, or perhaps none at all but the first, and dropping every consonant. Accordingly, instead of being pleased and affected with words agreeably and emphatically expressed, the hearer is disgusted with a set of mere notes, and those very badly produced. Others, on the contrary, by stretching their mouths too much, confound the narrow vowels with the broad, and begin almost every word with a labial or nasal twang. In studying the sounds of the vowels for singing, the pupil should practise

most frequently on the open *a*, *e*, and *o*, particularly the first; though not always on the same, in order that, by a diversity of exercise, he may not confound one vowel with another. From such practice, under a good master, he will more easily come to the proper use of words.

ORNAMENT AND GRACES.

It is an extremely false taste to overload every performance with a profusion of ornament. When a piece has intrinsic merit, or when a singer has a fine voice, ornament, if profuse, has more chance to injure it than to add to its effect. It is not to be denied, however, that ornament, when judiciously placed, is indispensable to a singer, and will require great care and practice in the acquisition. The following passage from the life of Rossini, by Count Stendthall, strongly illustrates the ideas of this great master upon the point.

On Rossini's arrival at Milan, in 1814, when he was in his twenty-second year, to compose the "*Aureliano in Palmira*," he became acquainted with Velluti, who was to sing in his opera. Velluti, then in the flower of his youth and talents, and one of the handsomest men of his time, had no small share of vanity, and was fond of displaying and abusing the powers of voice with which nature had gifted him. Before Rossini had an opportunity of hearing this

great singer, he had written a *cavatina* for the character he was to perform. At the first rehearsal, Velluti began to sing, and Rossini was struck with admiration. At the second rehearsal, Velluti began to show his powers of gracing; Rossini found the effect produced just and admirable, and highly applauded the performance. At the third, the simplicity of the *cantilena* was entirely lost amidst the profusion of the ornaments. At last the great day of the performance arrived. The *cavatina*, and the whole character sustained by Velluti, was received with rapture; but Rossini scarcely knew what Velluti was singing—it was no longer the music he had composed; yet still the song of Velluti was full of beauties, and succeeded with the public to admiration. The pride of the young composer was not a little wounded. This opera fell, and it was the *soprano* alone who had any success. The ardent mind of Rossini at once perceived all the advantages that might be taken of such an event. Not a single suggestion was lost upon him. It was by a lucky chance, we may suppose him to have said to himself, that Velluti discovered he had a taste of his own; but who will say that in the next theatre for which I compose, I may not find some other singer, who, with as great a flexibility of voice, and an equal rage for ornament, may so spoil my music, as not only to render it

contemptible to myself, but tiresome to the public? The danger to which my poor music is exposed is still more imminent, when I reflect upon the great number of different schools for song that exist in Italy. The theatres are filled with performers who have learned music from some poor provincial professor. This mode of singing violin concertos and variations without end, tends to destroy not only the talent of the singer, but also to vitiate the taste of the public. Every singer will make a point of imitating Velluti, without calculating upon the relative compass of his voice. We shall see no more simple *cantilenas*. They would appear cold and tasteless. Every thing is about to undergo a change, even to the nature of the voice. Once accustomed to embellish, to overload the *cantilena* with high-wrought ornaments, and so stifle the works of the composer, they will soon discover that they have lost the habit of sustaining the voice and expanding the tones, and consequently the power of executing *largo* movements. I must therefore lose no time in changing the system I have followed hitherto. I am not myself ignorant of singing: all the world allows me a talent this way. My embellishments shall be in good taste; for I shall at once be able to discover where my singers are strong and where defective, and I will write nothing for them but what they

can execute. My mind is made up. I will not leave them room for a single *appogiatura*. These ornaments, this method of charming the ear, shall form an integral part of my song, and shall be all written down in my score."

Such ought to be the practice of all composers ; and no young singer ought ever to attempt a grace that is not set down for him, or which is not pointed out for him by a judicious master. The violation of this rule may procure a momentary applause from a mixed audience ; but it will never ensure a lasting reputation, nor lead to establish first-rate excellence in simple execution. We shall now proceed to the method of teaching the principal graces employed in singing.

THE GLIDE, OR STRASCINO.

This ornament is little known and seldom used by our English singers, though it is introduced with fine effect by the Italians. It consists in gliding with the voice, so as to draw two distinct notes together, blending them so smoothly, equally, and gently, that not the least break or separation may be perceived. We may compare it to the soft, but rapid movements of the bow of the violin, passing in a smooth, indistinct, and undefined manner from one string to another ; or rather the soft murmur of flowing water, or one drop of dew falling into

another. The glide, therefore, excludes all beats, shakes, and turns. The ascending is much more difficult to execute than the descending glide; and to blend them equally, and without any break or harshness, they should be practised alternately—first two notes in immediate succession, and then at more distant intervals. The singer may occasionally avail himself of this elegant grace in passing more easily and smoothly to a third, or any other interval. English singers object to it, as too effeminate.

The unequal glide sometimes called dragging, is performed by hanging, as it were, upon some notes descending, and hastening the others, so as to preserve the time of the whole bar, varying the effect by passing from the *forte* to the *piano* alternately. The stealing of time, says Tosi, is an honourable theft in one that sings better than others, provided he make an ingenious restitution; but whoever knows not how to steal the time in singing, is destitute of good taste and scientific knowledge.

THE APPOGIATURA.

We have to borrow this term from the Italians, as there is no English word which will express its meaning. It is performed much in the same manner as the *strascino*: the principal difference being, that the glide is equal and applicable to notes at

any distance ; the *appogiatura* is unequal, and applicable only to a note in immediate succession, and that, either ascending or descending. It is unequal, because the voice is made to lean the least imaginable when the emphasis is made on the plain note, the graced note being marked small, as a light graceful step for the singer to the note succeeding, in order to connect and smooth the abruptness of the intervals. The rule is, to give the grace note more than half the time of the plain note which follows. When the grace note is accented, it ought to have three-fourths of the time, and the plain note one-fourth. When the *appogiatura* is not marked by the composer, it requires some judgment where to introduce it properly ; and it requires care to make it perfectly smooth : in pathetic passages, leisurely and tenderly—in lively pieces, hastily and closely, in order to add velocity to the air. The least jerk, or harsh tone in the voice, would spoil this ornament ; though, to please the vulgar, this is sometimes adopted as a substitute for spirit and animation. There is no qualification, indeed, which sooner or more strongly indicates fine taste and feeling, than the delicacy and elasticity of voice with which this ornament is performed.

The *appogiatura* may now and then, but not too frequently, be introduced by an aspiration,

which is a mere breathing or gentle sigh thrown in for the sake of pathos or expression. This, however, must always be naturally easy, not over strong, otherwise it would betray the appearance of art and affectation. The untaught singer may be recognised by the abuse of this, as well as of what is called the anticipation or groping for each succeeding note, as if the singer were stumbling about in the dark, and feeling his way like a blind person. Of all the graces, the *appoggiatura* is the least tedious; and, as Tosi says, may be heard the oftenest without tiring: yet it may be too often introduced, as some singers append it to every other note.

THE SLUR.

This grace is, to immediately successive notes, the same as the glide is to those which are distant by intervals; or it may be described as a brilliant progression of tied notes ascending or descending, flowing from the throat as lightly and smoothly as the glide, but more swiftly and smartly. Suppose it to be formed of a glide from a third or any other interval, by a supply or insertion of intermediate notes,—first make the glide, then convert it into a slur; and by practising in this way, you will acquire it neatly. Tosi observes, that the slur cannot go beyond a

fourth without displeasing ; yet for ease of execution it may be advantageous to practise through the whole octave, and this cannot be done too often, if you wish to obtain a volubility of voice in running divisions and cadenzas. It is to be remarked, that the slur ascending is more difficult and requires more practice than the descending ; and this more particularly in what may be called the slow or protracted slur, which is always made ascending, by bearing a little on the first note, then gliding smoothly and quickly up to the third above. The singer may avail himself of the slur in either grave, tender, or brilliant passages, the superior or inferior third or fourth, as the occasion may admit or taste may dictate.

THE TURN.

The turn, or more correctly the *return*, is a movement of the voice as it were round a note, executed as smoothly as the glide or slur, but more smartly ; with the swiftness, we may say, of the twinkling of the eye. It requires, for the most part, to be performed with a *sottovoce*, and is employed to give smoothness and connection to passages ; or, when the voice is raised rather than subdued, to increase the fire and spirit of passionate expression. It is, in fact, a sort of double *appoggiatura*, which is sometimes com-

menced from the note above, and sometimes from that below. It is used with the greatest effect in giving variety to a succession of the same notes.

THE SHAKE, OR TRILL.

This is both the finest of the vocal graces, and the most difficult of acquisition. Tosi says, there is no infallible rule discovered of teaching it. Grassineau describes it to be a quick beat upon two notes in conjoint degrees, as A, G, alternately one after another, beginning with the higher note and ending with the lower. Tosi again says, it is a violent motion of two contiguous sounds at the distance of a tone, of which the lower is called the *principal*, because it keeps with greater force the place of the note which requires it. The upper is called the *auxiliary*. He justly thinks it is of such consequence, that whoever wants it, or can execute it only imperfectly, can never be a great singer.

The best method of acquiring it, is to proceed slowly from the *auxiliary* note to the *principal*, and accelerate the motion, gradually, as is done with the finger on the harpsichord, to the utmost quickness. The difficulty, however, lies in proceeding from the slow and open motion to the quick and close, without fluttering, huddling,

jerking, gurgling, or shaking the jaw, and other intolerable defects. The learner may have some idea of the shake, and come to acquire it more exactly, if we describe it as a pulsation, vibration, or rebound, of the principal note to the auxiliary, after the manner of the rolling of a drum, by beginning slow, and beating gradually closer till it end directly on the principal note. It will be proper at first to practise plain, without attempting any stop, turn, or other flourish.

The shake should be seldom made with force *di petto* by any voice excepting a bass, which cannot easily form any other shake than the open and full from the breast. According as it corresponds with the harmony, which must, as Mr. Lanza remarks, be always attended to, the shake may either be from the note above the cadence or from the note below. A shake and turn is the moderately quick shake, ending with a slow turn, made by resting on the principal note after the shake, then returning to the auxiliary with an aspiration, and ending on the principal. In most cadences, especially of grave airs, you must fall upon the shake with an *appoggiatura* and aspiration. The singer, till he has acquired a good shake, had better not attempt any, but save appearances by ending with an aspirated *appoggiatura* or short turn.

The following is Tosi's description of eight different species of shake, which are well worthy of notice, though not all adapted to our immediate object. The first is the shake major, from the rapid movement of two contiguous sounds at the distance of a tone, as we have before remarked.— From this major shake all the others are derived.

The shake minor consists of a sound and its contiguous semi-tone major. Where the one or the other of these two shakes is proper, good taste and the nature of the compositions will point out; but the first or major shake is always excluded from the inferior or lower cadences. If the difference in the two shakes be not easily discovered in the singer whenever it is with a semi-tone, one may attribute the cause to the want of force of the auxiliary to make itself heard distinctly. Besides, this shake being more difficult to be beat than the other, every body does not know how to make it as it should be, and negligence becomes a habit. If you cannot distinguish this shake in instruments, the fault is in the ear.

The third species is the short shake, or *mezzo-trillo*, whose character will appear from its name. One who is master of the first and second, with the art of beating a little closer, will easily learn it, ending it as soon as heard, and adding a little bril-

liancy. For this reason, it pleases more in brisk and lively airs than in the pathetic.

The fourth is the rising shake, which is performed by making the voice ascend imperceptibly, shaking from comma to comma, without discovering the rise.

The fifth is the descending shake, which is done by making the voice decline insensibly from comma to comma, shaking in such a manner, that the descent be not distinguished. These two shakes, ever since true taste has prevailed, are no more in vogue, and ought rather to be forgotten than learned. A nice ear equally abhors the antient dry stuffs and the modern abuses.

The sixth is the slow shake, whose quality is also denoted by its name. He who does not study this, ought not therefore to lose the name of a good singer; for it being only an affected waving, that at least unites with the first and second shake, it can seldom please more than once.

The seventh is the redoubled shake, which is learned by mixing a few notes between the major and minor shake; which interposition suffices to make several shakes of one. This is beautiful, when those few notes, so intermixed, are sung with force. If, then, it be gently formed on the high notes of a superior voice perfect in this rare quality, and

not made use of too often, it cannot displease even envy itself.

The eighth species is the *trillo-mordente*, or the shake with a beat, which is a pleasing grace in singing, and is taught by nature rather than art. This is produced with more velocity than the others, and is no sooner born than it dies. The singer who mixes it from time to time, in passages and divisions, produces a fine effect. He who understands his profession, rarely fails of using it after the *appoggiatura*; and he who despises it is guilty of more than ignorance.

Of all these shakes, the two first are most necessary, and require most application of the master. It is customary, indeed, to sing without shakes; but the example of those who study only superficially ought not to be imitated. The shake, to be beautiful, requires to be prepared; though, on some occasions, time or taste will not permit it: but on final cadences, it is always necessary—now on the tone, and now on the semi-tone above its note, according to the nature of the composition. The defects of the shake are many. The long holding out shake formerly triumphed, and very improperly, as divisions now do; but when the art grew refined, it was left to the trumpets, or to those singers who waited for the eruption of a *bravo* or *encore* from

the populace. That shake which is often heard, be it ever so fine, cannot please: that which is beat with an uneven motion disgusts; that like the quivering of a goat, makes one laugh; and that in the throat is worse; that which is produced by a tone and its third is disagreeable; the slow is tiresome; and that which is out of time is intolerable.

The necessity of the shake obliges the master to keep the scholar applied to it upon all the vowels, and on all the notes he possesses; not only on minims or long notes, but likewise on crotchets, where in process of time he may learn the close shake and beat, and the manner of forming them with quickness in the midst of the volubility of graces and divisions. After the free use of the shake, let the master observe if the scholar have the same facility in disusing it; for he would not be the first that could not leave it off at pleasure. But teaching where the shake is convenient, besides those on cadences, and where they are improper and forbidden, is a lesson reserved for those who have practice taste, and knowledge.—So far Tosi.

The manner of waving or vibrating on a single tone with the voice, in a similar manner as is done on the violin, particularly on a semibreve, minim, or final note, has often a good effect; but great care must be taken to do it dexterously and with taste, devoid of any flutter or trembling.

DIVISIONS, OR PASSAGES.

These are ornaments left for the most part to the invention and taste of the singer, who introduces them for the sake of displaying his art and execution. They may either be gradual or remote, gliding or staccatoed. In gradual divisions the notes lie near, in others at a distance. When the divisions are marked in *staccato*, both the lively and swift are executed in the manner of running with the feet, by a light motion of the voice, taken off on each note; by which means every note is preserved moderately distinct, neither too much joined nor too much separated. If the notes are too much marked, and struck with too great a force and jerking of the voice, the division, instead of being an ornament, will resemble the agitation of laughing: if it be not marked at all, the notes will be confused and huddled together as in a bad shake. In the gliding division, on the other hand, which is always more gradual and slow than the former, the notes flow more smoothly and in closer union.

The pupil would do well to practise the marked divisions carefully, free from any jerking of the chin; and proceed, as in the case of the shake, first slowly, then quicker by degrees, taking care not to mark them unequally unless so directed by the

score. It will also be proper to begin with the most simple, and advance gradually to those more complicated and difficult.

THE CADENZA.

THIS is an ornament which is thrown in by the singer at the close of an air, and is precisely similar to the division, though often more protracted. It is the most difficult to execute well of all other parts of singing, and ought never to be attempted by beginners, nor those who have not a complete mastery of their art. If the cadenza be carried too far, we lose sight, in all probability, both of the original theme and expression, and have our feelings interrupted to wonder at the extravagant flight of voice which the singer is taking in defiance of taste and good keeping. Mr. Bacon judiciously remarks, that the best rule is to take for a theme one of the most striking passages, and one which best conveys the prevailing sentiment, and to paraphrase or expand its beauties by new and analogous combinations, either from fancy or from portions of the air. Indeed, it is the entire object of the cadenza to impress the auditor anew, or affect him more intensely; to manifest the science and imagination of the performer, and to display any parts of his voice or of his execution that the song may not have enabled him adequately to demonstrate,—giving him an opportunity, as it were,

of expressing extempore the prevailing sentiments of the composition according to the feelings it has awakened during the singing.

“Let the master,” says Tosi, “accustom the scholar to sing often in the presence of persons of distinction, whether from birth, quality, or eminence in the profession, that by gradually losing his fear he may acquire an assurance, but not a boldness. Assurance leads to fortune, and in a singer becomes a merit. On the contrary, the fearful singer is most unhappy; labouring under the difficulty of fetching breath, the voice is always trembling, and obliged to lose time at every note, for fear of being choaked: he gives us pain in not being able to show his ability in public; disgusts the hearer, and ruins the compositions in such a manner that they are not known to be what they are. A timorous singer is unhappy, like a prodigal who is miserably poor.”

The following directions by Corri are well worth attention.—“When requested to sing, comply with modest grace, and do not wait for entreaty. Banish from your thoughts all idea of what may be the opinion of your auditors on your singing, your figure, &c. Fix your whole attention on the subject of the music, and your manner of performance. If near the instrument, do not hold the piano-forte

or the chair of the person playing, but stand easy and unembarrassed. Conquer any alarm which may seize you on going to sing, by recollecting the general good-will of society, and the kind reception which the public always bestows on merit ; remembering also that every hearer is not a judge. Assume the cast of countenance adapted to the subject of the composition, or character in which you sing.

“ If you hold a book, do not let it be so near the face as to impede the sound. Do not show any motion of beating time, either with the head, fingers, or foot. You should delay till the symphony is over, to clear your throat from any little roughness or husk in the voice, which frequently the agitation attending performance will occasion, but prepare yourself during the symphony. If you miss any note or passage, commit any inaccuracy in time, &c. (and such accidents may happen to the best singer), do not be alarmed, and look about to discover who may observe it, which only serves to betray your error ; recollect how few, among even a great number of persons, are connoisseurs.

“ According to the size of the place, whether a small or a large room, or a theatre, proportion the degree of power you give your voice ; and this circumstance should also regulate the degree of the expression of the countenance.”—“ I attribute,”

says Dr. Kitchiner, "Mr. Garrick's superlative success to his proximity to his audience. I cannot imagine that there is any part which the English Roscius of that day played, but that several of our present excellent actors perform quite as well. The magic power, which some performers seem to possess, of making themselves heard distinctly all over the house without any apparent effort, depends infinitely more on the faculty they have of catching and caging the intense attention of the whole audience, than upon any extraordinary exertion of their voice. If our actors appear to fail in any part, it arises from no other cause than occasionally being obliged to overstrain their voice, which cannot be done without some distortion of the features."

MEDICAL MEANS OF IMPROVING THE VOICE.

THE first and most powerful means of improving the voice, particularly in the pitch and the tones, in which it is most deficient, is constantly exercising it. We have seen the most wonderful effects produced by this means in adding to the compass, the sweetness, and ease of the voice. With respect to ease and rapidity of transition, constant practice is indispensable, for the *reeds* of the voice are in this respect precisely like the fingers—rapidity and ease

can only result from long practice. Exercise and practice have also a powerful influence on the nerves and muscles—the two main instruments of the voice. A labouring man has the muscles and nerves of his arms greatly increased in size and power from continued exercise; and the same effect will be produced on the nerves and muscles of the voice by repeated practice. Without strength of the nerves and muscles, indeed, the voice must be weak, tremulous, squeaking, and without compass. The sky-lark, whose pipe is so powerful, is found to have these of extraordinary capacity. By very frequently practising the tones in which the voice is most deficient, the parts will, to a certainty, acquire strength.

To public speakers, we recommend not only frequent speaking aloud in private, at various pitches of the voice, but also frequent practice in singing in different keys, which requires more exertion and compass of voice, and will consequently more powerfully strengthen the muscles and nerves, by directing thither a greater supply of blood—the chief invigorating principle of the body.

Another very efficacious mode of strengthening the voice, is bathing and gargling the throat regularly morning and evening with cold water, which braces the parts, and invigorates the nerves. On this principle, all warm cravats, and other

clothing muffled up over the throat, will prove relaxing and injurious. If you are afraid of catching colds, defend well the parts below the ear and the angle of the jaw, and you may safely leave the fore part of the throat, where the organ of voice is, naked to the winter's blast, as is done by Lord Byron and other great men.

With respect to food and drink, all acids and astringents do injury to the voice, by hardening and crisping the more delicate fibres of the *reeds*. Why, then, do Mr. Mathews and others sometimes suck an orange during their performances? It is very wrong. Oranges, apples, stone-fruit of every kind, nuts, raisins, port-wine, rough-flavoured tea, &c., are all highly injurious to the power and polish of the voice, and ought to be avoided or used sparingly. If the throat be apt to become harsh and dry, the best moistener is peppermint or nitre lozenges, or a small bit of purified nitre or of sal prunelle, allowed to dissolve slowly in the mouth.

When the voice is required to be forced for any great emergency, we know nothing superior to a raw egg beat up with a wine-glassful of good Madeira, or half the quantity of brandy or rum and a little water, to which you may add with great advantage two or three tea-spoonfuls of the compound tincture of cinnamon. This tincture is of itself an

excellent tonic for the voice. The egg prevents the spirit from acting all at once, and it likewise preserves the stomach from getting out of order, which would also hurt the voice. We may add, that whatever tends to injure digestion or impair the general health will also hurt the voice ; such as irregular living, late hours, want of exercise, ignorant feasting, and all sensual indulgences.

PRACTICES OF THE ANCIENT ORATORS AND
RHETORICIANS.

The following is the curious account which Cresollius has left us of the arts of the Phonasci. Speaking of things injurious to the voice, he mentions figs, apples, pears, and nuts. Suetonius says of Nero, he was wont to abstain from such fruits and meats as are apt to injure the voice. Athenæus says, that Hegesianus retained a fine voice by abstaining from figs. Thrasybulus, when corrupted by a bribe, said he had got a hoarseness by eating wild pears, and did not speak in public. The Phonasci abstained from cold drinks. Indulgence in pleasure also, they held, weakens and depraves the voice, no less than it does the soul. So Aristotle, in his Book on the Soul, writes, that singers are used to abstain from indulgence in sensual pleasures, that they might be able for a longer time to preserve unimpaired the sweetness and

strength of their voice ; which would, they knew, be spoiled by debauchery. Indeed, it is fully ascertained, that the voice is affected in a very high degree by such indulgence. As soon as a youth attains the age of puberty, the voice is broken. Eunuchs, on the contrary, retain till the end of life the delicate sweetness of the boyish voice. Calvus, the orator, applied leaden plates to his body in the night, to counteract any tendency he might have to libidinous ideas and feelings, that he might be the more vigorous for application to laborious study, and for the exertion of public speaking. Drinking to excess is no less injurious, the voice being more easily broken by the repletion of the vessels. Speakers should guard against cold, and not devote themselves to studies too severe. Portius Latro is spoken of by Seneca, as careless of his health and voice in this respect ; for often, after having sat up at study the whole of the night, he would proceed straight from his meal to the rostrum. It is also bad for the voice to speak immediately after a full meal.

The old physicians said, that there are two sorts of things which are efficacious for increasing clearness of voice and rendering it sweet ; for certain substances mollify the windpipe and smooth pulmonary roughness, as sweet plums, barley-cream, juice of sweet almonds, seeds of mallows,

violets, liquorice, boiled honey, and sugar. There are certain other substances which do not mollify, but cleanse it as it were, and thus lessen gradually, so as ultimately to carry off blemishes in the breast and lungs. These are dried grapes, figs, hyssop, thyme, onions, leeks, and garlic. As to the onions and garlic, Aristotle, the great adept in the mysteries of nature, entertained the same idea. Since they have a detergent power, he says, they must conduce to goodness of voice. Accordingly, the Emperor Nero raised the leek to the rank of nobility—a piece of attention foolish and unprincely enough; of which Pliny speaks thus: “The Emperor Nero lately granted authority to the leek, appointed certain days of every month for show’s sake, because of the voice, on which it alone, without even the addition of bread, should be taken as food.” And in another passage he says the leek increases the brilliancy of voice. He ascribes the same efficacy to purslain also. St. Isodore thinks pulse has the same power: chanters, he says, constantly use pulse for the voice; whence, among the Gentiles, singers have been termed *Fabarii*, that is, Bean-men. Beroaldus, in his notes on the Nero of Suetonius, says, yolks of eggs are beneficial against roughness of the throat. Clearchus the poet said, that the white conger, and all viscid fishes, nourish respiration and render the voice freer and

more fluent ; so that admonition of Fortunatianus the rhetorician has not been rashly given, nor is it by any means to be disregarded ; namely, that attention to diet, and abstinence from excess in drinking, and all sensual indulgence, render the voice firm and sweet. Among berries, the carpesium or cubebs is very much commended as useful for the same purpose. Hermolaus Barbarus mentions it in the following terms:—" Carpesium, if kept in the mouth, makes the voice clear in delivery:" therefore, Bernard Justinian, a very learned and eloquent man, never harangued without using this sort of seed. The ancients had some kind of drink, which they called plasma, for assisting the voice.

Be sure with liquid gargle forth to rinse

The mobile throat.

PERS. *Sat. I.*

Cresollius cannot conjecture what this drink was composed of. Martial seems to speak of it as merely warm water : " But *you*," he says, " utter many things in a long speech ; meanwhile, from glass jars, you pour down your throat the tepid water." Cresollius supposes that it was wine, not plain, but mixed with water, and medicated or mulled wine, which St. Jerome and Pope Gregory complained that the singers used too freely before they went in to perform the service of the church. Jerome says, " We must sing to God, not with the

voice, but with the heart." Gregory complains, that "whilst a good voice is sought, a good life is neglected." The drink was, however, supposed to have a good effect on the voice: hence these monkish lines,

"Not voice, but vow; not harp, but heart;
Not loudness, but love,—is melodious to God."

Two complaints of the throat affecting the voice, are mentioned by Galen: the one, κόπον τονώδη, rendered 'fatigue from over-exertion or over-straining;' the other, κόπον φλεγμονώδη, a kind of inflammation in which the parts where the vocal organs are situated are affected with a strong feeling of heat and burning from recrements having collected about them. When, therefore, such matter collects, the Phonasci, Galen says, were wont to use meats which were made up of milk,—*amylum*, which was a kind of food or medicine made of wheat unground;—*alica*, which was a food made of a certain sort of wheat with eggs, cheesecakes, and sweetmeats: others say these are prepared from secamum and honey; others understand sweetmeats and marzepanes. Galen advises to drink sweet theracan wine and sybelites, that is, a drink consisting of milk and honey boiled rather long, *amylum* having been added during the process. Quintilian recommends walking, anointing, abstinence from sensual indulgences, and temperance in food, so as not to overtask the stomach.

Beroaldus in Suetonius says, the voice is improved, if, on getting out of bed, we forthwith exercise the body by walking. He desires also, if one's voice be fatigued, that he have *laser* poured into him by drops when he goes to sleep. *Laser* is supposed by some to be benzoin, and by others *asafoetida*. Exercise of walking is beneficial; but exercise of the voice itself, most of all. Goodness of voice, says Quintilian, is increased by care, but is injured by neglect. Reading aloud is a good exercise of the voice. Anciently, all who attended to their voice, subjected it to some accustomed exercise, early in the morning while they were yet fasting.

Phonasci, *Vociferarii*, and *Vocales*, were the common appellations of those who taught the exercise and management of the voice. Tertullian (alluding to the taming of wild animals, breaking of horses, &c.) calls them breakers or tamers of the voice. Galen says they recommended to their disciples the frequent use of the warm bath. Cresollius mentions other practices of the *Phonasci*, some of which are curious, and some he considers useful; although we do not think that all the practices which those people followed are to be recalled into use. They imposed tasks in the morning, and daily, as Aristotle states; which practice would, perhaps, says Cresollius, be rather troublesome to youthful delicacy in our age. They applied a plate of metal

to the breast ; but for me, says Cresollius, I should grant them leave to dispense with this. For coursing about on foot also, they had stated times which they scrupulously observed, but which there could be no scruple to omit at present. They abstained from certain meats, and there was a certain sort of drink which they particularly prized.

What, then, is it which deserves to be borrowed from the Phonasci for our practice? I have no doubt, says Cresollius, that those, to use the words of Galen, called exclamations are fitted for our times. Their custom was to raise the voice by little and little, by regular step, and, after a short time, to lower it in the same way. They did so sometimes for softening and strengthening the wind-pipe, sometimes for attaining variety, so that there is no modification of tone which they did not adopt on occasion. We know from Seneca, (the father,) a most learned man, that this practice was adopted not only by the Greek, but also by the Latin orators. On mentioning Portius Latro, who followed a course in public speaking, as well as a mode of life different from those of other people, he says, that it was the custom of this Latro to take no pains whatever with his voice ; that he did not raise it by regular steps, by little and little, from the lowest pitch to the highest ; that he did not descend from this again to the lowest, by like

intervals, which seems to have been the common practice of other speakers. That is what the Greek teachers, in their peculiar phrase, term *pæonizing*. Alexander Aphrodisicus says of it, that the Phonasci, when about to *pæonize*, clear and soften the windpipe. Agreeably to this, an author on Herennius says, the windpipe is injured if, before the voice has had the previous gentle exercise, they strain it with loud speaking.—So far Cresollius.

The following passage we translate from Fortunatianus:—"How is the voice," says he, "to be taken care of? Whenever you have to deliver speeches, pronounce something beforehand, if you have opportunity, that you may soften the passages of the voice. But if one must speak, without having been previously aware that he was to do so, what then is to be done? In that case, you may effect the same thing by modifying your action in delivering the speech itself. In the commencement, let the tone of voice be low; then raise it by little and little. What is to be observed in concluding? We must take care not to let the voice sink down all of a sudden from exclamation; just as any sudden burst of vociferation at the commencement is to be avoided. In taking food, are there not some things to be attended to? Yes; it is requisite that you attend to your stomach. If

dining improve the state of the stomach, you must dine often (not *always*, however); but it ought to be upon tender food in small quantity, which may be dissipated by the time of supper. The articles of food to be used at supper, must neither be numerous nor difficult of digestion. What is to be attended to as to drink? Abstain from cold drinks; by these the windpipe is *crusted*, but it is opened by warm drinks. Now this is the channel through which the voice flows. If the voice has been slightly fatigued, what should be done? Use the sharper sorts of food; by which, if the voice by any obstruction has been rendered discordant and inarticulate, these obstructions may be broken through; for, to such persons, the physicians prescribe the pouring of *laser* (benzoin or asafœtida) by drops into their stomach when about to sleep, and order them to take some vinegar when they have awaked. But if the voice has been broken very much, how may it be repaired? By thirst, and abstinence from drink, in order to dry its channels; also by much walking, that moisture may be drawn off from the higher regions to the lower. By abstinence from wine likewise, than which nothing is worse for the voice when it has been hurt. But if we cannot abstain, we ought to prefer it sweet and diluted; also, for the windpipe, the mildest food is beneficial. If we must drink wine not prepared as above, but in its common state,

what is to be done? Even should you be in this predicament, you are not to use a great number of medicines; use chiefly liquorice, or have its juice under your tongue, if you can, not in too great quantity, in the manner of a lentil or pea. What is to be observed in general? Do not be at too much pains in taking care of your voice: do not indulge it too much; and yet spare it so as that the windpipe may have neither too much nor too little moisture; for it ought not to be wet, but slightly moist. As to your speeches, consider whether they are to be invective, or defensional, or descriptive, or narrative, &c.; also, if you are to have the figures of rhetoric in view. As to words, do they not claim some consideration;—does nothing depend on them? By all means: for as we come to know things by means of the ideas of them which enter our minds, so ideas are explained by means of words. Should we suit our delivery to all the words? Not to all, but to those that require it. What sort of regard should be paid to the characters of individuals? Bear in mind the object you wish to compass, for whom you act, against whom, in whose presence, who are hostile, who friendly. In regard to place, what should be attended to? Bear in mind where you act. In regard to time, what? When you are going to speak, see that the time be not improper.”

RULES OF MODERN WRITERS.

“The first rule,” says Austin, “for the preservation of the voice, and which is equally supported by ancient authorities and modern experience, is, that the public speaker should, if he ‘strive for the mastery,’ be habitually temperate in all things; moderate in the use of wine, and in the indulgence of the table, and not given to any personal excess. A bloated body, and an enfeebled constitution, are not only injurious to the voice, but render a man equally incapable of any other mental or bodily exertion. The voice should not be exerted after a full meal. This rule is a consequence of the first. The voice should not be urged beyond its strength, nor be strained to its utmost pitch, without intermission; such mismanagement would endanger its powers altogether, and it might break: frequent change of pitch is the best preservative. The same rule holds in music: in well-composed songs, skilful singers may sometimes, for brilliancy or effect, and to show the compass of the voice, run up and touch the highest notes, or descend to the lowest; but they should by no means, in their modulations, dwell long on the extremes. High passion disregards this wholesome rule, but the orator will not

be rash in its violation ; nor should the composer of what is to be spoken or sung be remiss in his attention to it."

At that period of youth when the voice begins to break and to assume the manly tone, no violent exertion should be made ; but the voice should be spared until it becomes confirmed and established. Neither, according to this rule, should the voice, when hoarse, if it may be avoided, be exerted at any time.

If a boy would give himself the chance of having a *contralto*, establishing his constitution, and making his fortune, let him begin to think and take heed from fourteen ; for a cold will break the voice before the time of nature, omissions of singing often but not too long at a time will sink it, and vicious gratifications may ruin it and the constitution before the age of manhood. The singer may with more safety indulge at thirty, when the constitution of man is fixed, or even at forty, than at eighteen, when nature is in a state of growth and immaturity; though, indeed, many young proficient in music have made a shameful and speedy end, who have promised fair in the beginning ; and might have proceeded happily, but, setting off with over much sail and too strong a tide, suffered shipwreck in the channel before they could well get out to sea.

Some things are found serviceable to the voice, and are used by modern singers; they may be equally advantageous to a public speaker. Warm mucilaginous and diluting drinks, in case of dryness of the fauces, or slight hoarseness, barley-water and tea, preparations of sugar, sugar-candy, barley-sugar, and the various sorts of lozenges, which modern ingenuity prepares so elegantly: a new egg beat up is reckoned the best substance for immediately clearing the voice, and is preferred by the Italian singers. Garlic is much used, notwithstanding its offensive odour. The great means of improving the voice, as in all other improvements, is constant and daily practice. The professional exercise at the bar, the senate, and the stage, if properly attended to, with a view to improvement, may suffice for the orator of our times; but the ancients, besides this, were in the daily practice of preparatory declamation;—their rule was, after proper bodily exercise, to begin at the lowest tones of their voices, and gradually to the highest. This was called *anaphonesis*, and sometimes the *pæan* and *munio*; the *munio*; the former the exercise of the voice in the highest pitch, the latter in the lowest. They used to pronounce about five hundred lines in this manner, which were committed to memory, in order that the exertions of the voice might be the less embarrassed.

It is a great and general mistake among the players at rehearsal, as the common practice is, to mutter over their parts inwardly, and keep in their voices, with a misimagined purpose of preserving them against their evening acting: whereas the surest natural means of strengthening their delivery would be to warm, dephlegm, and clarify the thorax and windpipe, by exerting (the more frequently the better) their fullest power of utterance, thereby to open and remove all hesitation, roughness, or obstructions, and to tune their voices, by effect of such continual exercise, into habitual mellowness, and ease of compass and inflexion; just from the same reason that an active body is more strong and healthy than a sedentary one.

The second rule has been anticipated, which is bodily exercise. The ancients recommend walking a certain space before breakfast—about a mile. Riding on horseback we do not find recommended or practised as mere exercise. In order to strengthen the voice, Mr. Sheridan advises, that any person who has fallen into a weak utterance should daily practise to read and repeat in a large room, in the hearing of a friend. His friend should be placed, at first, at such a distance as he may be able to read in his usual manner; the distance is then gradually to be increased, till he shall be so far from him that he cannot be heard beyond him

without straining. There should his friend hear the most part of his declamation: and through this practice should he proceed step by step daily; by which he may be enabled to unfold his organs, and regularly increase the quantity and strength of his voice. Perhaps the same practice might more easily and effectually be made in the open air, as every speaker cannot conveniently obtain the use of a room of the requisite dimensions.

Mr. Walker's rules for strengthening the voice are excellent and practicable. His general principle is, that, in order to strengthen the higher tones of the voice, such passages should be practised as require the high tones. These are particularly a succession of questions, ending with the rising inflexion. For the middle tones, passionate speeches requiring them should be practised; and for bringing down the voice, which is apt to run wild, and not to be in our power when long continued above, the succeeding sentence is to be begun (if the subject admit) and delivered in a lower tone.

VIII.

DISEASES FROM SINGING AND PUBLIC SPEAKING, WITH THE DISORDERS OF THE VOICE.

DR. RAMAZZINI, in his Latin treatise on diseases incident to Professions, has devoted a chapter to those incident to exertions of the voice in either singing or public speaking; and his work has lately been translated and much enlarged by M. Patissier of Paris. The most important remarks of these authors, as well as of others who have written, together with the observations we have ourselves made, on the subject, we shall now lay before our readers.

CONSEQUENCES OF OVER-EXERTION OF THE VOICE.

In the directions which we gave for improving and strengthening the tone of the voice, we particularly stated, that the exercise of singing, or public speaking, drives a greater supply of blood to the organs exerted. Now, this tide of blood may, according to circumstances, either contribute to strengthen the voice, or to produce inflammation of the throat. All depends on the strength of the

parts, and the moderation of the singer. If you sing at all, you are certain that a gush of blood will be driven to the throat; and if the blood-vessels are strong enough to bear it, "all's well;" but if not---if they are stretched and swelled beyond their healthy diameter,—then slight inflammation, hoarseness, or something still worse, may follow.

The *inflammation* may sometimes be so violent as to cause sharp pain and swelling of the throat, with high fever, great anxiety, shrill and suffocative breathing, and difficulty of swallowing. There may be little cough, though the hawking and efforts to expectorate are distressing. The face is swelled, the eyes start out, as in cases of strangling, and the patient calls for air as if in the agonies of death, which usually occurs in a day or two, unless the disease be subdued. Dr. Brassavoli mentions a case of this kind which proved fatal in the short space of ten hours; and Dr. Schenck, another case which caused almost instant suffocation. No time ought to be lost in such a case; and leeches, to the number of two dozen or more, should be instantly put to the throat, and a brisk purgative of Epsom salts taken. The inflammation, again, may go on more slowly, till it end in an *ulcer*; and when the skin is once broken, and a sore formed there, it becomes almost impossible to heal it; and it usually wears out and proves fatal to the unhappy patient, in the very same way as

consumption. Physicians, indeed, call it *Laryngeal Phthisis*; which means, consumption of the throat. The only remedy which is likely to effect a cure is calomel; of course, judiciously given. M. Patissier of Paris has given us the following two fatal cases:—

A professional singer, at the Theatres des Boulevards, at Paris, became affected with hoarseness, dryness, and pain of the throat, a fatiguing cough, and loss of appetite and sleep. He gradually lost his voice, and became meagre and wasted, till at length, worn out with the irritation and the consumptive fever, he died. On opening the body, his throat was found to be extensively ulcerated, particularly about the organs of the voice, and the gristle of those parts was absolutely rotten, or, as the surgeons call it, *carious*. Morgagni also relates the case of a young man who had a fine voice, and, from over-exertion in singing, he produced ulceration in his throat. He was suffocated in trying to swallow the soft yolk of an egg. On opening the body, his throat was found in one mass of ulceration.

Margarita Salicola-Scevena, a celebrated singer of Modena, told Dr. Ramazzini, that whenever she exerted herself much, she was attacked with hoarseness, and spit up an incredible quantity of phlegm; and was often also affected with giddiness and swimings in the head.

The effects of singing on the head and brain need not surprise us, if we attend to what is open to every body's observation. Mercurialis, in his work on Gymnastics, well observes, that in singing a high counter, or in a falsetto voice, there is often produced swellings of the head, beating of the temples, starting of the eyes, and ringing of the ears; arising, says Dr. Ramazzini, from the greater quantity of air necessary to produce and sustain an acute tone, stopping the return of the blood from the head; and in all cases flushing the face, and causing the pulse at the temples to beat strongly.

Such are some of the more immediate effects of immoderate exertions in singing; but there are others no less troublesome and dangerous, though care may render them less fatal. All exertions in singing, and particularly bass singing, have a violent effect on the belly and bowels. From frequently taking in a long and deep breath, and stretching all the parts of the belly till some of them give way, a rupture or *hernia* is the consequence, as was observed long ago by the celebrated Fallopius. Dr. Ramazzini also found this annoying complaint very common among the nuns, who were chiefly employed in chanting and singing; and the same accident often occurs to the monks, who sing in the cathedrals. Ramazzini often found rupture produced in a way precisely

similar in children, who, by exerting their voice in crying, overstretched and burst the muscles of the belly. In such unfortunate cases, which are, we lament to say, but too common, we know of no remedy but a truss.

We request you to remark, that we do not mean that such diseases attack every body who sings; but we say, that they are readily produced by immoderate and incautious exertions of the voice; and, as we have more than once similarly remarked, it will be small consolation to you, if you should be attacked with inflammation or ulceration of the throat, or with rupture, that Braham, Sinclair, or Madame Catalani continue to sing and to preserve their health. It has been well remarked, that great vocal ability often demonstrates great constitutional strength, and particularly the power of resisting colds and catarrhs. Amateur singers are always "taking colds;" professed singers very rarely indeed, though they are so much exposed to night air, and in the thin clothing, too, of their stage dresses. Mrs. Salmon, for example, in last December, sang at Manchester on Wednesday; at Leeds on Thursday; at Sheffield on Friday; and at Hull (70 miles distant) on Saturday. This however, great as the exertion must have been, is not equal to her famous week, in which she appeared on the Monday in London, on the

Tuesday at Oxford, on the Wednesday in London, on the Thursday at Oxford, on the Friday in London, and on the Saturday at Bath. What strength of constitution and power of voice it must require for such efforts !

COLDS AND HOARSENESS.

The most frequent disorder to which the voice is liable, is a huskiness or hoarseness consequent upon exposure to cold or damp. It is of the greatest importance, therefore, to all who have to exert the voice in speaking or singing, to know the best means of avoiding the consequences of such exposures.

Cold will do no harm, if you are not improperly exposed to it. For instance, it will injure the feet, but it will not injure the hands ; it will injure the stomach, but it will do no harm to the face. The danger, then, is when you are heated to perspiration in the theatre, the concert-room, &c., that your feet be exposed to some cold stream of air, or become cold from damp ; and that thirst may induce you to eat ices, or take a draught of any thing cold. This rashness has often caused instant death, and oftener laid the foundation of a lingering and fatal illness. The reason of such consequences is to be found in the current of the blood. Cold applied suddenly to the stomach, in

the same way as a blow on the stomach, makes the blood-vessels contract and expel the blood in a gush to the heart and lungs; and if they are not strong enough to withstand the flood, there is instant suffocation. If the patient escape this, there is every chance for the increased flow of blood causing inflammation of the lungs or the heart; or, if there be weakness there, bringing on cough and decline. Similar though not so sudden effects arise from cold or damp feet, chiefly through their sympathy with the bowels and the head.

Now, mark the distinction: when cold is applied to the hands or the face, the constant exposure of these to the open air renders the effect much less sudden; and though it do check perspiration, and cause the blood to recede, yet all this is so gradual and gentle, that not only does no injury follow, but it brings with it great benefit and comfort.

These principles are invariable, and they lead to safe and comfortable practice. Avoid, while you are warm, all ices and cold liquors, as you would avoid poison and pestilence; and particularly take care of cold feet, cold draughts of air, or going suddenly into a cold from a hot room, in a state of perspiration. But do not suppose by this that we mean to deprive you of all access to cold, and keep you half suffocated by the exhalations of

lungs, and lamps, and gas-burners. Cold water to the hands or the face is the only safe and pleasant cooler when you are heated. This is, indeed, the only method of enjoying the hottest suffocation of theatres and assemblies without danger; and not only so, but with an inexpressible degree of comfort and pleasure, which can by no other means be procured. The apparatus must be contrived according to the ingenuity and convenience of those who use it. The principle is generally and universally applicable, and far excels, in efficacy and pleasure, the most exquisite fruits and ices; while it is safe, cheap, and strengthening. //

But it would be unfair to leave those who have had the misfortune of a dangerous exposure to cold, or who have imprudently taken an ice, while perspiring, without some consolation in the form of a prescription. We advise, therefore, that after imprudent exposure, or imprudent ice-taking, or cold drinking, our fair readers (who are, on account of their delicacy, in the greatest danger,) to take the following powder:—Take sixteen grains of nitre, two grains of ipecacuanha, one grain of opium: mix them well, and after a warm foot or hip-bath, take the powder on going to bed. Breakfast in bed next morning, and lie an hour or two afterwards. Should this not be sufficient to expel the dis-

ease, the same must be repeated on the following night. Cold, however, has some chance to make an attack in spite of all precautions, either on the head or the lungs. If it affect the head, it produces what is called a sneezing cold, which, though it be not so dangerous as an affection of the lungs, is at first much more troublesome; for the head feels heavy, stupid and aching, and the nostrils are stuffed, which makes breathing difficult and laborious. The matter stands thus:—

The throat and nostrils are lined with a fine, delicate, and easily irritated skin, like that which lines the inside of the cheeks. Now, what happens to the lining of the throat and nostrils in a common cold? Is there not a hoarseness in the throat, or a straitening of the passage of the nostrils, if not a complete stuffing up, rendering it difficult, if not impossible, to breathe through them? Whence, and how, then, does this hoarseness, and straitening, and stuffing of the nostrils arise? The answer to these questions will give you a key to the immediate origin of colds.

In consequence of the contraction of the blood-vessels of the feet, or of any other part of the body, by the application of cold, the superabundant blood, which cannot find a passage where it was wont to flow, is thrown upon some other part; and it always

chooses the weakest or most sensitive organ of the body, into which it can most easily push its unwelcome way. Now, in the case of a cold in the throat, or in the head as it is popularly called, the superabundant deluge of blood is thrown into the sensitive lining of the throat or the nostril; and the first consequence, as you know, is a swelling of the parts and a narrowing of the passage, with difficulty of breathing, and a painful feeling of distension or bursting, which extends over the forehead and causes severe headach—all from the extra quantity of blood pushed into the blood-vessels. But you must understand, as we formerly remarked, that the delicate skin goes much farther than the nostrils. The eyebrows are placed over a hollow bone, with a small cell scooped out in it, which communicates with the nostrils, and the thin membrane in question lines the whole of the cells under each eyebrow. The inflammation, then, of these cells under the eyebrow explains the severer pain experienced in that spot. The same lining of delicate skin goes back from the nostrils to the internal ear and upper part of the throat; and the deluge of blood, driven thither by cold, spreads along the membrane like water through blotting paper, and the ears are involved in the pain, while the throat becomes raw and sore, and the voice

rough, husky, and hoarse. This may properly be called the first stage of inflammation.

The mucus by which the throat and the nostril are moistened in a state of health, is all filtered from the blood, in a similar way with the bile and the urine; but, in order to get into the nostril, the little canals through which it flows must be open and free. The swelling, however, produced by the overflow of blood, at first presses upon these canals and obstructs them; and, accordingly, at the beginning of a cold in the head, the nostril is usually drier than natural—or, from the smaller bore of the canals, allows only thin watery matter to pass; but in a short time, in consequence of the universal law of nature, by which an effort towards recovery is made in all diseases, the little canals exert themselves to overcome the pressure of the surrounding blood-vessels; and the instant they are successful in regaining their proper width, a quantity of mucus flows into the nostril, proportioned to the increase of the blood from which it is filtered. Every person who has ever been affected with a cold can witness to the truth of this history, though he may not have known the philosophy of it till he read our explanation.

A third circumstance of importance occurs as an effect of this state of the nostril. In consequence

of proper remedies, or by the remedial operations of nature, the rush of blood diminishes by degrees, till the parts resume pretty nearly their former state. Often, however, a thickening or bump remains in some particular spot, generally on the outside of the nose or its neighbourhood, arising from blood or other matter having oozed out and escaped from the vessels, into which it cannot again get access. This may continue for a long period without causing much uneasiness. A still more common circumstance arises from the blood having been withdrawn from many small vessels into which it had forced itself, as it is seen to do into the vessels of the white of the eye when it is bloodshot. Many of these small blood-vessels run through the outer skin; and when gorged with blood, this skin is, of course, raised somewhat from its connexions; consequently, when the tide of blood subsides and leaves the small vessels of this skin empty, the skin itself, being in a great measure disunited from the parts it covers, peels off in the form of thickish scales, precisely in the same way as a scab is cast off from a healed or healing sore.

Such is the general history of the affections produced in the nostril by a common cold. An additional flow of blood, or, in other words, inflammation, more or less violent, changes the healthy structure of the parts, and gives rise to obstruc-

tion. Inflammation, indeed, changes the structure of all parts of the body*. The hard bone, by inflammation, becomes soft; the firm sinew becomes spongy; the transparent membrane becomes thick and opaque; and the pliant parts become firm.

The cause of the hard bump remaining after inflammation, requires farther explanation. If you ever ruffled a bit of skin on your finger, you must have remarked, after the blood ceased to ooze out, that the wound was covered with a clear watery-looking fluid, which thickened on exposure to the air. Now, in inflammation, even where the skin is not broken, this fluid, which is drained off from the blood, escapes into every cranny and interstice between the blood-vessels, the skin, the fat, and the muscles; and it is the accumulation of this which causes the hardness. It is precisely the same thing which you may observe in the more external case of the scar left by a cut, which is always hard, and different in appearance from the surrounding skin. This explains most satisfactorily the cause of eruptions on the skin, and soreness in the nostrils, which arise during or after a cold.

* “La flogosi,” says Professor Tommasini, of Bologna, “dice egli, tende sempre a disorganizzare o in una o nello altra maniera le parti che sono da usa attaccate.”

From this plain sketch you may infer, that the sooner you can draw off the increased tide of blood from the nostrils, forehead, and throat, the more powerfully you will prevent the cold from *sitting down*, as it is called,—that is, establishing the inflammation and swelling of the blood-vessels, which, after a space, will not, even by the withdrawal of the blood, return to their healthy calibre. This may be accomplished in two ways; as you may either carry off the accumulated blood by leeches applied to the forehead and roots of the nostrils, or drive it downwards, by applying cold water to the face and forehead, and immersing the feet in warm water, into which a handful of mustard has been thrown. The leeches carry off the blood entirely, but it will require at least a dozen or twenty to make any impression. The cold water makes the blood-vessels contract, and the warm water to the feet makes the blood-vessels there expand, to receive what has been withdrawn from the head.

When the throat and ears are much affected, it is best to draw off the blood to the outer skin, by wrapping up the throat in warm flannel by day, and at night wearing a woollen nightcap, with a lamb's wool or fleecy hosiery stocking wrapped round the throat, and pinned to the nightcap. We have ourselves employed this with uniform

success, in preventing colds, for many years. It is necessary, however, that it be done the very first night you feel a cold coming on; because, if you delay, you will find the disease has got too powerful for this simple remedy.

When a cold is once established, it will, in spite of remedies, run a course of about ten days or a fortnight, and will then usually subside, whether remedies be used or not—a circumstance which often gives the credit to particular medicines, which is in truth due to nature. In this state of things, confinement within doors is advisable, and the treatment just recommended may be pursued, together with every means for getting the blood out from the inflamed membrane to the outer skin. If the pain is severe, leeches may, with this view, be applied to the forehead, or you may use the following warm lotion:—Take one or two teaspoonfuls of the juice of horse-radish, or flour of mustard; the same of the spirit of rosemary; an ale glassful of hot brandy. Mix, and apply to the brow, with a linen cloth; or, in slighter cases, sponge the parts with hot vinegar, into which a little of the spirit of rosemary has been put.

When there is troublesome hoarseness and roughness at the top of the throat, or back part of the nostril, chew a bit of horse-radish frequently. It is very powerful in dissolving recent inflamma-

tions of these parts. Cayenne pepper and mustard have a similar effect.

SNUFF-TAKING.

No public speaker, professional singer, or teacher of languages, ought to indulge in the practice of taking snuff, as it infallibly injures the articulation and weakens the force of the voice, by not permitting a free exit for the air from the lungs; which, of course, it must cramp and confine in the action of breathing. Besides, as the nerves then of the nostrils are more naked, or thinly covered than in any other part of the body, they are extremely sensitive; and when snuff is applied to them, all the nerves of the system become affected by sympathy; hence the taking of snuff has, like smoking, a narcotic effect on the brain, and, through it, on the mind itself, and particularly tends to weaken the memory.

If used as a medicine only, and on occasions that require such a stimulus, the taking of snuff may be of some advantage; though in such cases, some physicians prefer a liquid snuff. If the stimulus, however, of the snuff be too violent, it may bring on so profuse a discharge from the nostrils as may relax and corrode them, and produce an incurable *polypus*, or a concretion of clotted blood, so as to block up the nostrils altogether. In se-

veral diseases of the head, eyes, and ears, the taking of snuff may occasionally supply the place of an artificial issue ; though an extravagant use of it will most certainly produce a contrary effect ; such as collections of matter in the head, bleeding of the nose, deafness, and other complaints. To those who are consumptive, who are subject to spitting of blood, or have symptoms of internal ulcers, nothing can be more prejudicial than snuff-taking.

The practice infallibly vitiates the smell, of course it impairs the taste, and it also dulls the hearing ; for as the internal tube of the ear opens directly behind the back part of the nostril, the particles of the snuff often lodge and accumulate there to a very injurious degree. By stimulating the nerves of the eyes also, it often brings on serious diseases of sight ; so that it appears it is hurtful to all the senses except the sense of touch.

Snuff, if taken too freely, may fall into the stomach and produce serious disorders of digestion and of the liver. Besides, it may also occasion continual and troublesome flatulence ; for when the nose is obstructed, the person must breathe chiefly by the mouth, and must in this way swallow great quantities of air, which will bulge out the stomach, and do much injury to health, and may end in confirmed hypochondria.

A maiden lady, who was in want of something to comfort her for the want or the loss of suitors, asked a physician whether snuff was injurious to the brain? "No," said he, "for nobody who has any brains ever takes snuff."

Snuff-taking, besides these evils, is often, as Mr. Earle of St. Bartholomew's Hospital informs us, the origin of cancer on the upper-lip and sides of the nose. In an old lady he had to cut away from such a cause, part of the side of the nose. In a gentleman much given to snuff-taking, there was produced a corroding or eating cancerous ulcer, with hard edges, which caused the greatest alarm in the mind of the patient. Mr. Earle having been called in before the disease had spread too far, succeeded in removing it, and the patient was very thankful to have his life saved, even on the hard condition of giving up his favourite pinch. Those who allow snuff to incrust on their upper-lip or to harden in the nostril, well deserve, to suffer the penalty of their dirty habit, even should it lead to cancer and the necessity for the surgeon's knife.

LOSS OF VOICE AND DUMBNESS.

The incapability of speaking, or *aphonia*, as it is professionally called, may arise from different causes, such as derangement or disorder of the glottis—the immediate organ of the voice; the want of power to imitate sounds in consequence of deafness; certain nervous affections; the want or loss of the tongue, &c.

“Speech,” says Dr. Ryan, of Kilkenny, “may be injured or suppressed by diseases of the nerves, which supply the organs that assist in producing that noble faculty; by pressure or wounds; by affections of the larynx, its muscles, ligaments, cartilages; by disorder of the glottis, windpipe, throat, palate; by tumours or polypi; by cancer of the lips, cheeks, or nose; by inflammation, enlargement, cancer, or congenital vitiation of the tongue; or by its *frænum* being too short. Forestus describes inflammation and suppuration of that organ; and Galen mentions a case of watery tumour of it, so great as to cause it to be protruded from the mouth; and a second case, which did not proceed from cancer or watery tumour, though it increased to considerable extent, but from too copious a supply of aliment deposited in its substance. Claudinus was consulted in the case of a girl aged twelve, whose tongue was won-

derfully enlarged, not from watery swelling, cancer, or other vitiations of its structure, as it readily diminished by pressure; but it proceeded from a rupture of the frænum or bridle, which caused a great determination of blood to that organ; and, strange to relate, this tumour was said to increase in the morning and became livid, while it declined in the evening.

“I have lately seen,” continues the Doctor, “a case of cancerous enlargement of the tongue, which was greatly aggravated by the use of mercury, and which suppressed the faculty of speech, and ultimately destroyed the patient. I divided the frænum in a girl aged ten, who could scarcely speak, yet obtained an evident degree of fluency immediately after the operation. If both recurrent nerves which supply the larynx be divided, speech and voice will be abolished; if a wound be made below the larynx, the voice will be suppressed; if above it, speech will be destroyed; and the diminution or destruction of nervous power in the fifth pair of nerves is the principal cause of loss of motion in the tongue. Avicenna relates a case of loss of voice, induced by the application of deep scarifications to the hinder part of the head, which he said wounded some of the nerves that proceed from the brain through that part. If eruptions be suddenly repelled, or congestions of blood take place

in the throat or tongue; or the suppression of periodical evacuations in full habits; or the influence of fear or other passions; the too free use of spirituous potations; or whatever injures or destroys the parts connected in producing voice or speech, will cause an abolition of that faculty. Certain spasmodic diseases, as hysteria, also affect it. I have seen two cases, in both of whom the incisore teeth had been displaced by external violence, they laboured under loss of voice until they had been replaced, after which the voice and speech became natural, and the teeth perfectly firm. In low fevers, or in apoplexy, the voice is regained slowly: and in the case of a young lady, who was in the last stage of consumption, I lately observed this clearly illustrated: she lost the power of speech for thirty hours, appeared dozing, the pulse being scarcely perceptible; the ammoniated oil was applied to the throat, which caused several feeble motions of the tongue and efforts to speak, which faculty she gradually regained, and retained to the third day, when she expired."

The instances of speechlessness produced by an injury to the nerves of the tongue, are not common. But a division of the recurrent nerves, which are distributed over the larynx and glottis, produce a speechlessness that is rarely, if ever, recovered from; for here the muscles belonging to the ary-

tenoid cartilages being rendered paralytic, can never be brought into a due degree of constriction; the glottis remains permanently open, and the diameter of the larynx suffers no variety of contraction or dilatation. Galen seems to be the first anatomist who noticed this effect, or rather ascribed it to its real cause; for it was known before his time, that, by tying the blood-vessels of the windpipe, the noisiest animal is immediately struck dumb, and made quiescent. It was supposed that the state of the blood-vessels themselves, and not of the nerves, included with them in the thread, was the cause of this effect; that the blood became intercepted in its passage from the heart, and the animal became mute because rendered comatose: and hence the name of carotids, or soporific vessels, was given to the arteries, the tying of which was supposed to produce this very singular effect.

Galen, however, demonstrated very satisfactorily that the dumbness is, in this case, entirely owing to the pressure of the thread on the accompanying nerves: and he afterwards produced to his opponents two cases of boys, who in a greater or less degree had lost their voice in consequence of the recurrent nerves being cut by surgeons unacquainted with anatomy, in extracting scrofulous tumours from the neck. In the one case, only one of these

nerves was divided, and the voice was lost altogether. A whizzing senseless noise, indeed, remains in most instances, as Vezalius has correctly observed; but there is no vocal sound articulate.

Where this speechlessness has followed upon an injury to some branches of the nerves of the tongue, we have numerous examples of recovery. In one instance, the dumbness ceased suddenly, after the patient had been speechless for not less than ten years.

In other instances, dumbness is produced suddenly, from a total exhaustion of nervous power in the vocal organs, without any organic loss whatever: a sudden and overwhelming emotion of the mind, from terror, anger, or any other passion, has frequently had this effect in irritable habits. So has a violent fit of hysterics, or any other vehement shock which instantaneously exhausts the nerves of their power and the muscular fibres of their irritability; as a stroke of lightning, or a severe and unexpected blow on the stomach, will sometimes exhaust the entire system of its vital energy, and make life immediately cease: a sudden chill, as from drinking cold water during a violent heat, or the shock of a sudden fall, has frequently produced it, of which numerous instances are recorded in the *Ephemerides of Natural Curiosities*. Speechlessness of this kind has sometimes arisen from delite-

rious exhalations, from eating mushrooms; and in one instance, recorded in Hufeland's *Annals*, by repeatedly rubbing the wound made by a poisonous insect with saliva, and as often putting the finger to the mouth to obtain a supply of fresh fluid. In like manner, Bonet informs us that the same effect has followed from putting into the mouth and swallowing a piece of money cankered with the rust of verdigrise.

Where medical aid is required, our dependance must be on tonics, local or general, and topical stimulants. Blisters and masticatories have chiefly been made use of, and frequently with good effect; as has the vellication of a hair-brush contrived for the purpose. The dumbness has sometimes yielded to emetics, at others to electricity; and in a few cases to a severe cough; and occasionally the same, or a like violence which occasioned the disease, has removed it, and the cause has become the cure; as is reported of Athys, the son of Cræsus. In like manner we have examples of its having yielded abruptly to a fit of anger, or terror: in one instance to a fit of laughter; in another to a blow on the head.

“We have examples,” says Dr. Good, supported by indisputable authentication, “of persons who, having lost the entire organ of the tongue, and a few of them of the uvula also, have still retained a power of speaking, and even of expressing them-

selves with a clear and accurate enunciation." Such examples are, indeed, not very common, but they seem to have occurred in all ages, and especially when it was the barbarous custom among the Turks, Goths, and other half civilized nations, to cut out the tongue of the unhappy wretches whom the chance of war had thrown into their hands as prisoners.

There are some persons who disbelieve all stories of this kind that have descended to us, for the mere reason that they have never witnessed any thing of the same kind in their own age or country. But such persons would have also joined the King of Siam in disbelieving the Dutch ambassador's assertion, that the rivers in his own country became so hard and solid during the winter, that men and women could walk and skate upon them. The accounts are too numerous, and, in many instances, too well supported, to be treated with scepticism; and all that is left to our judgment and ingenuity is, not to deny the evidence, but to account for the fact. Hundreds of cases might be quoted upon this subject; but the following may be sufficient, which are from recent times, and from authorities that may, indeed, be disbelieved, but cannot be disputed.

In the third volume of the "*Ephemerides Germanicæ*," we have the history of a boy, who, at

eight years of age lost the whole organ of the tongue, in consequence of a slough, proceeding from the small pox, and who was able to talk after its separation. The boy was exhibited publicly, but a trick was generally suspected, in consequence of which the boy and his friends were summoned to appear in court, before the members of the celebrated University of Samur. In the presence of this learned body he underwent a strict examination as to the loss he had sustained, and the lingual powers he still possessed. The report was found correct; and the University, in consequence, gave official attestation to the fact, in order, as it expressly asserts in its records, that its reality might not be called in question in succeeding times.

In the “*Mémoires de l’Académie des Sciences*,” for the year 1718, is an account of a girl who was born without a tongue, but had nevertheless learned to speak, and talked as easily and distinctly as if she had enjoyed the full benefit of that organ. The case is given by a physician of character, who had accurately and repeatedly examined the girl’s organs of speech, and was desirous that others should examine them also.

About seventy years ago our own country furnished us with another equally striking instance of the same power, which forms the subject of

various papers in the Philosophical Transactions, drawn up chiefly by Dr. Parsons, at the time, and printed in the volumes that were published between the years 1742 and 1749. It is the history of a young woman of the name of Margaret Cutting, of Wickham Market, near Ipswich, in Suffolk, who, when only four years old, lost the whole of her tongue, together with the uvula, from what is said to have been a cancerous affection; but still retained the power of speech, taste, and swallowing, without any imperfection whatever; articulating indeed as fluently and with as much correctness as other persons; and articulating, too, those peculiar syllables which ordinarily require the express aid of the tip of the tongue, for exact enunciation. She also sung to admiration, and still articulated her words while singing; and could form no conception of the use of a tongue in other people. Neither were her teeth in any respect able to supply the place of the deficient organs; for these also were but few, and rose scarcely higher than the surface of the gums, in consequence of the injury to the sockets from the disease that had destroyed the tongue. The case, thus introduced before the Royal Society, was attested by the minister of the parish, a medical practitioner of repute, and another respectable person. From the singularity of the case, however, they evinced a commendable tardiness of

belief. They requested another report upon the subject, and from another set of witnesses, whom they themselves named for the purpose, and for whose guidance they drew up a line of categorical examination. This second report soon reached the society, and minutely coincided with the first: and to set the question completely at rest, the young woman was shortly afterwards brought to London, and satisfied the Royal Society in her own person.

To explain this unexpected power, we should not only turn our attention to what is actually, and in our own days, accomplished by ventriloquists; but should recollect that the tongue is only a single organ, employed in the articulation of sounds, and that the throat, nostrils, lips, and teeth, bear at least an equal part, while the glottis, which forms all the vocal, or vowel sounds, is the chief organ of the whole. In reality, out of the twenty-four articulate sounds which fill up our common alphabet, the only two in which the tongue takes a distinct part, are the *l*, and the *r* though it is auxiliary to several others; but the guttural, or palatine, as *g*, *h*, *k*, *q*; the nasal, as *c*, *d*, *z*, together with all the vowels, which hold so large a space in our vocabularies, are but little indebted to its assistance.

It is singular that so delicately sensible an organ as the tongue should receive the severest injuries,

and submit to very violent operations, with less serious mischief than almost any other organ of the same size in the body. And it is on this account that the cruel and barbarous manner in which the tongue was extirpated by the ferocious tribes that overran Europe from the East, in former times, was rarely productive of fatal consequences. Sir Everard Home published, many years ago, a paper upon this subject, containing various cases of Sections of the tongue, to a less or greater depth, in consequence of diseased action. The operation was, in every instance performed by the ligature. He does not state what effect was in any instance produced on the speech.

THE
ART OF IMPROVING THE EAR.

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THE EAR.

THE ear is so very complicated an organ, that we despair of making it as easily understood as the voice; for its structure is both intricate, and its chief parts so sunk in the bones, that it is difficult to describe them in language, and particularly as many of them are very minute. As in the apparatus of vision, so in that of hearing, we find a collection of organs which concur in their physical properties, and behind them a nerve destined to receive and transmit impressions. So much difference of opinion, however, has prevailed as to the use of the several parts, that it is by no means easy to determine which we should adopt. We must always indeed expect to find difficulties which we cannot surmount,—something, beyond

which we cannot pass in the explanation of the works of nature. We go as far as we can, but we are compelled to stop somewhere.

1.—ANATOMY OF THE EAR.

The ear is usually described to consist of two divisions, the outward and the inward, which are separated by what is well known by the name of the drum; or we may consider it as divided into the external, the middle, and the internal ear—a division which we shall follow in our description.

THE EXTERNAL SHELL OF THE EAR.

In different individuals the size of the external cartilage or shell, is very different. The outer surface of it, which in a well-formed ear projects a little forward, presents on its anterior surface five eminences and three cavities. The whole is spread out into a sort of funnel, well adapted from its windings for collecting the waves or pulses of sound afloat in the air around. The substance is also carefully fitted for its office, being very sensible and composed of a firm though elastic texture of gristle or cartilage, and not of unyielding bone, nor of soft fleshy muscle, though there are small muscles which stretch or relax it as occasion may require. The skin which covers it is thin and dry, and is attached to the gristle below by a strong tissue,

that contains but a very small quantity of fat. By the skin is seen a great number of pellicles, which prepare and furnish the shining matter that gives to the skin its polish, and, perhaps part of its flexibility. As many nerves and blood-vessels run through this part of the ear, it is very sensible and easily becomes red.

The lap of the ear is very different, however, from the part which we have just described, being soft and flabby, and full of fat; but this is perhaps intended to prevent the escape of the sound collected in the upper windings of the shell, when it has reached the entrance of the passage. We make this supposition on the principle that soft substances, like the lap of the ear, are well known to be bad conductors of sound, as we shall afterwards see.

We can by a very simple experiment demonstrate the utility of the external ear in making sound distinctly heard. Place the palms of the hands closely on the ears, so as to press the windings of the funnel flat to the temples, and the sounds which you hear, instead of being distinct, will be confused and humming, like the sound of running waters, or the distant murmur of a forest. A similar effect will be produced by interrupting the communication in any other way, as in the amusement well known to children, of

putting a shell to their ear to produce, as they imagine, the sound of the sea waves breaking on the shore. We may remark here, that the external ears of Europeans are much more flat, and lie closer to the temples, than in savage nations; a circumstance evidently caused by the dress worn in infancy, which cramps the outer ears of our children, and consequently injures the distinctness of our hearing for life. M. Magendie, however, affirms, from experiment, that the removing of the external ear altogether does not injure hearing more than a few days, till the sufferer becomes accustomed to the new condition of the organ. We should think that this must depend on the age of the person. Some individuals have the power of moving the external ear, similar to what we observe in the lower animals; but this peculiar faculty does not appear to improve or increase the hearing.

The several inequalities and windings of the outer ear meet in the narrowest part of the entrance, which is protected from the intrusion of insects and from dust by little hairs and by a bitter soapy substance, called the *wax of the ear*. This is prepared by numerous small glands within the skin of the entrance to the passage, and conducted to it through several short pipes. The chief use of the wax, as Dr. Elliotson has remarked in his edition of Blumenbach, may be to preserve the

passage in a fit state for conveying sounds, upon the same principle that a flute sounds best when moistened, and badly when dry.

The entrance of the ear, thus formed by the union of the windings of the shell, takes the form of a tube, enters the bone of the temple, and is continued through it, till it reach the drum. The skin which lines it is extremely thin and delicate, and is reflected over the drum so as to cover it. This tube is oblique and winding, to prevent, as we may suppose, the sound being reflected from the drum into the air again without producing the sensation of hearing, which would, to a certain extent, be the consequence, were the tube straight. It is not an unfrequent occurrence, particularly in infants at birth, for the outer passage to be crossed in part, or altogether, by a preternatural membrane. When this is the case the hearing is much injured; but it is for the most part easy for a surgeon to remove the evil, by piercing or breaking the membrane, an operation which often restores the hearing instantaneously. In after-life, the ear is sometimes obstructed by fleshy substances called polypi, growing in the tube. These also the surgeon can remove.

THE TYMPANUM, OR DRUM OF THE EAR.

The drum of the ear consists of a membrane, or thin parchment-like skin, stretched obliquely across the bottom of the tube, for the reception and reverberation of the sounds that are propagated thither from the air. It is covered, as we have seen, on the exterior surface by a continuation of the skin that lines the tube. The middle layer of the membrane of the drum immediately under this covering is quite transparent, and in a healthy state has no vessels carrying red blood, which can be discovered. When this is inflamed, however, it becomes quite red with blood-vessels, as well as the exterior and interior layers which cover it. It is remarkable that the whole membrane is braced like the head of a drum; but, in place of the strings of the drum, the membrane of the ear is stretched and kept tight by the threads of a muscle. So at least it is conjectured by Sir Everard Home from analogy; for these threads, it is to be remarked, have as yet been only discovered in large animals, such as the elephant. When any foreign substance touches the drum, exquisite pain is produced, in consequence of its great sensibility. The drum, it is also to be observed, is not quite plain, but a little depressed inwards, as if kept down in the middle by a weight.

CHAIN OF BONES.

Behind the drum is placed a chain of small bones, or springs, so arranged as to hinge upon one another, and when one moves all the others follow, in consequence of their connexion with small muscles, the utility of which will appear as we proceed. There are four of these bones, which from their several shapes have been called the *hammer*, the *anvil*, the *lenticle*, and the *stirrup*. The first, which is shaped like a hammer, is in contact with the middle of the drum, and when a sound strikes upon the drum, it must put this bone in motion; that is, the sound causes the muscles which are attached to the bone, to contract and pull it; while this movement consequently re-acts upon the drum. When the motion is thus originated, it is communicated in succession to the other three bones of the chain, the last of which is the one that has the form of a stirrup, with a solid base, and this plays, like the key of a flute upon a hole, or opening, that leads to several channels or passages farther inward. The internal ear has several of these passages, which are much in the form of wind instruments, of the convoluted kind, being full of turns and windings, like a French horn, and so intricate as to have obtained the name of the *labyrinth*.

THE EUSTACHIAN TUBE.

Musicians are well aware that a violin, or a common drum, will not sound well, without a hole in it, to cause the sound produced to come with more force by a communication with the air without. The sound, indeed, would otherwise be imprisoned in the instrument, and would be heard muffled and confined by the surrounding wood. The same would be the case in the ear. The sound transmitted from the drum to the bony springs, and by them to the parts of the labyrinth, would be smothered in its passage almost as soon as it had passed the drum. To prevent this there is a contrivance exactly like the hole in the common drum and in the violin.

Behind the drum of the ear, a tube opens for this purpose and runs by the side of the labyrinth, widening as it goes, till it ends in a trumpet-like opening behind the curtain which separates the nostrils and the mouth. It is called the *Eustachian tube* from its describer Eustachius. It was fancifully supposed in former times that this tube was a drain for the corrupt humours of the ear, as the nose was for those of the brain. But were this true, (as it is only a fancy) the throat is certainly not the most eligible part to make a common sewer for corruption. Immediately within the inner termination, indeed, are numerous wrinkles

and cells which give out mucus similar to the mucus of the nose ; the skin which lines it being a continuation of the skin of the nostrils.

The use of this tube, as we have now explained it, and as we formerly alluded to it, page 17 above, is perhaps more correctly understood than any other part of the ear. It is so indispensable indeed to perfect hearing, that when it is in any way obstructed, there always follows some degree of deafness. When it is opened also, by opening the mouth, we hear better than when the mouth is shut. M. Itard controverts the received opinion of sound being transmitted through the tube ; for though we hear the tick of a watch better by putting it into the mouth in contact with the teeth, yet by putting it back on the tongue and shutting the mouth, it cannot be heard at all.

The Eustachian tube, however, is but little exposed at its inner termination to obstruction from extraneous substances. It is too high placed, and too well defended by the curtain between the mouth and nose, to be liable to accidents from particles of food or drink getting into its mouth. The chief cause of obstruction here is inflammation from colds or other causes. Most people, indeed, have experienced some time in their lives a temporary deafness, or imperfect hearing, from cold affecting the nostrils or the throat, and

spreading from them along the Eustachian tube. In such cases also pain is felt stretching along the tube to the drum of the ear.

INJECTION OF THE TUBE.

In such cases it has lately been the practice to inject warm water and other liquids into the tube by ingenious instruments contrived for the purpose. The instruments used at Paris, by M. Itard, are a syringe, a silver tube, an elastic gum tube, and a silver frontlet, employed as its name implies. The success depends much on the skill and dexterity of the operator. M. Itard fixes the frontlet first, then measures the distance between the superior alveolar margin and the basis of the uvula. This measure is marked on the silver tube, which is then introduced into the nostril on the side corresponding to that which it is wished to inject. Its entrance into the tube, which can only be known by consummate tact, will enable the operator to fix its other extremity immovably to the frontlet, and proceed to the adaptation of the syringe.

Mr. Buchanan of Hull, who lately published a large folio pamphlet on the ear, remarks that the great difficulty of introducing the instrument is the excessive irritability of the membrane of

the nostrils. To overcome the disagreeable sensation caused by the introduction of the foreign substance, he advises tepid water to be first injected into the nostril, and the instrument to be dipped into oil of almonds, heated blood warm. The flat piece of silver which is called a frontlet, ought, he says, to have five or six holes in its edges, so that it may be secured in a proper position by means of a ribbon passed round the head, and through two of the holes of the frontlet, and the ends of the ribbon then brought forward and tied behind.

The tube may also be permanently obstructed by disease, or even before birth, in which case deafness is always the consequence. Formerly this affection was thought incurable, till the genius of Sir Astley Cooper suggested to him the experiment of admitting air into the inner ear by perforating the drum. This bold operation was successful, and many have since been restored to hearing who had been totally deaf. The smallest hole in the drum is sufficient, but it is difficult to keep a small hole open, and the surgeon is often obliged to make a larger one than he should otherwise prefer. By opening the mouth, the orifice of the tube is enlarged, and hearing rendered more

acute, an observation which did not escape Shakespeare.

I saw a smith stand with his hammer thus,
The whilst his iron did on the anvil cool,
With *open mouth* swallowing a tailor's news.

King John.

When the drum of the ear is rent or accidentally perforated, smoke can be passed from the mouth through the ear. The illustrious Baron Haller was wrong when he said this feat was fabulous.

THE LABYRINTH OF THE EAR.

The labyrinth is filled with a fluid of a watery consistence, which acts, as is conceived, a similar part in the conveyance of sounds, as the fluid in the mouth and nose in conveying tastes and smells. For the fluid in the labyrinth of the ear is in contact with the nerve, which is spread in numberless branches over its inner surface. This opinion, however, though very probable, is different from that of some distinguished inquirers.

The labyrinth will be most easily understood by considering it as made up of three parts,—the vestibule or oval gallery, on the door of which the base of the stirrup-bone plays, as we have said, like the key of a flute; the canals, in the form of a half circle leading from the gallery; and the cochlea,

or snail-shell, so called from its shape, with which also the gallery communicates.

The vestibule, or gallery, is a small oval cell, nearly filled with a watery fluid, contained in two little bags, on which a part of the nerve of the ear is spread. From this cell several small passages run into other parts of the labyrinth. The oval hole, on which the base of the stirrup-bone plays, we have already described.

The three canals, in form of a semicircle, open into the vestibule by five passages. The entrance into each is too small to admit the head of a pin, and the entrance is the widest part of them. Their substance is bone of uncommon hardness, but very brittle and easily broken. Along the canals run small transparent tubes, which are connected with one of the bags in the vestibule, where all the three tubes unite. On these tubes a portion of the nerve of hearing is likewise spread.

Some have imagined that the canals were enlarged at the ends to give room for the circulation of sound in the way that takes place in a trumpet ; but the wider portion in the living ear is filled up by a similar widening in the transparent tubes, which must prevent the reverberation of sounds in them.

The cochlea, or snail-shell, the last portion of the labyrinth, is carved out of the same hard

and brittle bone which composes the three canals. It has two openings, one into the vestibule, the other into the part behind the drum. It lies somewhat obliquely, the broader portion or base inwards, and the point outwards and a little downwards in the fore and under part of the hard bone of the temple. Its interior is made up of two central hollow pillars, placed point to point, around which are disposed spiral plates, somewhat like a hanging stair. These have been compared to the strings of a harp, continually shortening from the base to the top of the triangular cone. This arrangement was formerly supposed to be adapted to consonance or unison, according to the variety of grave or acute sounds, but this doctrine is now given up.

The cochlea, like the other portions of the labyrinth, contains soft parts, consisting of a mucus-like membrane; a soft cartilage or gristle; a nervous pulp, formed by the ends of numerous divisions of the nerve of hearing; and the common watery-fluid of the labyrinth. When this fluid is wanting, the hearing is destroyed. The reason why the sharpening of a saw, the grating of a knife on a plate, and other sounds, affect the teeth and set them on edge, is, that from the nerve of the ear a branch goes off to the mouth. From the same connexion also children in teething are often

subject to runnings behind the ears ; and in violent toothache, a blister behind the ear will relieve the pain. When through any cause the nerves spread upon the parts of the labyrinth are weakened or injured, the hearing is impaired or destroyed, or it may be rendered more acute, as in females during their confinement. In hysterical fits, and in fevers, when the whole nervous system is affected, the hearing is often lost during their continuance. So little is known, however, of the causes of the multifarious species of the deafness called nervous, that the cure is for the most part attempted by experiment and conjecture, sometimes by blistering and depletion ; and at others by supporting and invigorating the general health. It is in some cases a very dreadful disorder, inducing from great pain, delirium, and even madness.

An elastic air, says M. Richerand, continually renewed by the Eustachian tube, fills the internal cavity or barrel of the ear ; small muscles attached to the bones forming the chain, move or relax the membranes to which they are attached, and thus institute a due relation between the organ of hearing and the sounds which strike it. Hence it will be easily conceived, that the relaxation of the drum, effected by the anterior muscles of the hammer-like bone, must weaken the action of

acute sounds; while the tension of the same membrane, by the internal muscles of the same bone, must increase the force of grave sounds. In the same manner as the eye, by the contraction or dilatation of the pupil, accommodates itself to the light, so as to admit a greater or smaller number of its rays, according to the impression which they produce, so by the relaxation or tension of the membrane of the drum, or of the oval hole, the ear reduces or increases the strength of sounds, whose violence would affect its sensibility, in a painful manner, or whose impression would be insufficient. The iris of the eye and the muscles of the stirrup and hammer-like bones, are therefore the regulators of the auditory and of the visual impression. The air which fills the ear is the true vehicle of sound; this air diffuses itself over the cells, whose use is to augment the dimensions of the internal ear, and the force and extent of the vibrations which the air experiences within it.

The essential part of the organ is doubtless that which exists in all animals endowed with the faculty of hearing. This part is the soft pulp of the auditory nerve, floating in the midst of a gelatinous fluid, contained in a thin and elastic membranous cavity; and this is found in all animals, from man to the cuttle-fish. In no animal lower

in the scale of animation has an organ of hearing been discovered, although some of these inferior animals do not seem to be absolutely destitute of that organ. This gelatinous pulp is in the lobster, contained in a hard and horny covering. In animals of a higher order, its internal part is divided into various bony cavities. In birds, there is interposed a cavity, between that which contains the nerve of hearing and the outer part of the head; in man and in quadrupeds the organ of hearing, as we have just seen, is very complicated, inclosed in a bony cavity, along which sonorous rays are transmitted after having been collected into fasciculi, by trumpets situated on the outside.

II.

NATURE OF SOUND.

The intimations of the external world which we receive through the ear, are the result of certain concussions that take place among the objects around us. When bodies are brought into sudden contact, or a single body is made to vibrate or expand suddenly, it must displace a quantity of the surrounding air. The air which is thus displaced,

in its turn displaces that portion of air which is next to it or beyond it on every side, above and below, before and behind, on the right and on the left. This displaced portion of air displaces again what is beyond it, and so on, in a manner similar to the circles of water which arise from throwing a stone into a pond. In the case of sound, however, the waves are not in superficial circles, but in spheres like the coats of an onion.

The air, besides, is elastic, or has the quality of springing back to its first position, like Indian rubber when stretched out and let go. Therefore the waves of sound are not regularly progressive, like those of water, but vibrate or tremble forwards and backwards as a musical string is seen to do when it is struck. The first wave, accordingly, when it strikes on the air around it, drives this air forwards while it is itself driven backwards.

This shows that the motion of sound is also very different from that of wind, and is scarcely, if at all, perceptible to sight or touch; for it is well known that sounds which would shatter windows to pieces, will not move a feather nor the flame of a candle, so different is the motion from wind. Though, however, sound is not usually felt by touch, there are instances in which it appears to have been thus perceptible. Kersting, who lost both his sight and hearing after manhood, had his sense of touch so

wonderfully improved that he could read a book of large print by passing his fingers along the lines. He was also a practical florist. But the most wonderful faculty which he possessed, was that of distinguishing sounds by the touch, being able to comprehend the greater part of a conversation when the mouth of the speaker was applied to his hand. The letter R, however, grated so much on his feelings, that his friends took care to avoid pronouncing it as often as possible. This feeling is distinct from the sympathetic thrilling occasioned by certain sounds felt all over the body. Mr. P. Knight says his very limbs were thrilled on hearing the commemoration of Handel at Westminster. Lackington, the celebrated bookseller, in his memoirs, mentions a lady, who, though deaf, took great delight in music, which, she said, she felt at her breast and in the soles of her feet. Of course we do not rest much on this instance, though it is not improbable.

VELOCITY OF SOUND.

Sound is in this manner propagated, or travels in all directions from the place where it is produced. The quickness with which sound travels is much inferior to the quickness of light, which goes 95,000,000 miles, that is, it comes from the sun to the earth, in eight minutes and a half, while

sound only goes 1142 feet in a second. By knowing this we can make near estimates of distances otherwise inaccessible. A thunder-cloud, for example, will be between six and seven miles distant if half a minute elapses from the time we see the lightning to the time we hear the thunder. The distance of a ship at sea is calculated in the same way, by attending to the difference of time observed between the flash and the report of her guns.

It is another proof of the difference of wind and sound, that sound travels very nearly as quick against the wind as with it, though a contrary wind diminishes, and a fair wind increases its *loudness*.

That sounds of different tones travel with the same velocity is evident from what we observe on listening to a peal of bells, or to any instrument of music; for all the tones come in succession to our ears, whereas if they did not travel at the same rate, they would be heard confusedly jarring with one another. The lowest whisper accordingly travels as rapidly as the loudest thunder.

It is also to be remarked, that sounds proceed with the same velocity through a long or a short space, a large or a small distance. Sounds also travel with the same velocity by night and by day; in damp and in dry weather. This, how-

ever, is not to be understood as having the same effect on their loudness and lowness.

Like the rays of light, sound is supposed to proceed in straight lines; though from its being greatly more reflexible than light, it can pass through the winding tube of a French horn, which light cannot do. Not only so, but the intensity of sound is much increased in the passage through a winding tube—a principle on which the speaking-trumpet is constructed.

ECHOES.

Like the rays of light also, sound can be reflected from certain bodies, and when this takes place it is called an *echo*, a word derived from the Greek. By taking advantage of the principle, echoes have been formed by art, as mirrors have been made for reflecting light. It was once thought that concave bodies were indispensable to produce echoes. A single flat wall, however, will produce an echo, and Le Cat says he has even observed that some convex bodies reflect sound, though a vault or a bending wall is the best form.

PENETRATION OF SOUND.

A third property, in which sound resembles light, is its power of penetrating and passing

through hard substances. Light passes through glass and diamonds, and sound in a similar manner passes through iron and other metals, as well as through wood. It may be also remarked, that, other circumstances being the same, the harder or more dense the substance, sound penetrates it the more easily, and in this respect it bears a strong resemblance to heat.

When the ear is placed close to one end of a log of wood, however long it may be, and the other end struck or a watch applied to it, we are sensible of the sound of the watch or of the stroke, though it be too slight to be otherwise perceptible. When a piece of metal is applied to the bones of the head or to the teeth and struck, we also feel an indistinct sensation of sound, and this is felt even by those who are deaf to sounds conveyed through the air. The blind and deaf boy Mitchel, found his greatest pleasure in striking his teeth with a key, and was highly displeased when he was given a piece of wood as a substitute.

CONDUCTORS OF SOUND.

Wool, down, and feathers, are consequently bad conductors of heat, and also bad conductors of sound; though perhaps, there is no substance whatever through which sound will not pass more or less. The sound of the grand cataract of Niagara

is found to be sensibly diminished when the ground is covered with snow, which, according to our principle, is a non-conductor of sound.

Air, when very much rarefied, as in the exhausted receiver of an air-pump, will scarcely transmit sound at all; and it has hence been hastily concluded, that air is the only medium of sounds. It would, we think, have been more philosophical to have inferred that every substance whatever when rarefied, if that were possible, as much as the air in the exhausted receiver, would transmit sound with equal indistinctness.

The clearness of sound, indeed, seems to depend very much on the density of the vehicle by which it is conveyed. In the cool of the evening, and still more as the night advances, when the air is no longer rarefied by the sun, we hear sounds, those for example of distant waters, which in the day are altogether imperceptible. The circumstance of sounds being more distinctly transmitted in cool air, has not escaped the observation of our poets.

—Who the *melodies* of morn can tell,
The wild brook babbling down the mountain's side ;
The lowing herd, the sheepfold's simple bell,
The pipe of early shepherd dim descried
In the low valley. Echoing far and wide ;
The clamorous horn high o'er the cliffs above,
The hollow murmur of the ocean tide,

The sky-lark's song, the linnet's lay of love,
And the full choir that wakes the universal grove.

The cottage curs at early travellers bark,
Crown'd with her pail the tripping milk-maid sings,
The whistling ploughman stalks a field and park,
Down the rough slope the ponderous waggon rings.

Beattie's Minstrel.

We have often observed a similar clearness of sounds in frosty weather. For example, we think we can hear the sound of a distant carriage much more distinctly in a frosty day than in the heat of summer. It is evidently the same principle which causes iron to transmit sounds well, and feathers to transmit them imperfectly.

WATER A MEDIUM OF SOUNDS.

Many experiments have been made on the capability of water to transmit sound. The Abbé Nollet, among others, took much pains to decide the question. By practice he acquired such management of himself under water, that he could hear the sound of the human voice, and even recognise airs of music. When he struck together two stones which he held in his hands, his ears were shocked almost beyond bearing, and he even felt a sensation on all the surface of his body, like that produced when a piece of metal held in the teeth is struck by another piece of metal. He

observed also that the more sonorous bodies, when struck under water, gave a less vivid impression than others less sonorous. These experiments were successfully repeated by the late Dr. Monro, of Edinburgh.

SONOROUS SUBSTANCES.

All bodies are not equally fitted for producing sound. Those which have the greatest degree of elasticity appear to be the most sonorous. It is owing, indeed, to the great expansible force and elasticity of the air, that gunpowder and the electric flash, by rending it and forming a vacuum, occasion the loud sounds which often strike us with terror. The cracking of a waggoner's whip affords a good illustration of the sound of thunder or any other explosion. The sudden jerk of the end of the whip-cord displaces a portion of air, and forms an empty space into which the adjacent air violently rushes. The air which formed the several sides of this empty space, thus collapsing with a shock, produces the sound.

The changes which take place among the minute particles of bodies, in consequence of the vibrations from which sounds arise, are remarkably different in metals, in wood, and in musical strings. This can be illustrated in the case of metals, by repeating the experiments of Dr. Chladni

of Berlin, who took plates of different metals, and having strewed them with fine sand, caused them to sound by drawing over their edge the bow of a violin. In these experiments the sand is found to arrange itself according to the vibrations produced; and it is curious that the form which the sand takes is different in different metals. Anybody can easily repeat those experiments with sheet-lead, sheet-iron, copper-plates, &c.

MUSICAL STRINGS.

In the case of musical strings, as in other sounding bodies, the quicker they vibrate the more sharp is the sound; and this does not depend at all on the slowness or quickness with which you strike them, but on the tension and thickness of the string. We are told, but on the authority of what experimental calculation we know not, that the gravest sound which the ear can perceive is formed of two thousand vibrations in a second; and the sharpest sound, of twelve thousand.

Thus in the piano-forte and the harp, the high treble notes are produced by short, small, tight strings, and the deep low bass notes by strings which are long, thick, and little stretched.

NATURE OF HARMONY.

On striking a bell or a musical string once, we may hear by minute attention, first, the fundamental sound or note; secondly, the octave or eighth note above; thirdly, the twelfth; and lastly, the seventeenth. These are called harmonic notes.

It is from the vibrations of several strings taking place in a certain order that agreeable or disagreeable feelings are excited. The sounds producing these opposite feelings, are said to be harmonious or to be discordant. For example, if the vibrations of two strings are performed in equal times, the same tone is produced by both, and they are said to be in unison. Again, if one string vibrate in half the time of another, the *first* vibration of the latter will strike upon the ear at the very same instant as the *second* vibration of the former.

These will accordingly agree or harmonize, and their concord is by musicians termed an octave or eighth, because there are eight distinct tones inclusive between the tones of the two strings. If the *second* vibration of the first string strike the ear at the same instant with the *third* vibration of the second string, the compound sound or concord is termed a fifth, for a similar reason.

When the vibrations of two or more strings strike the ear at different instants, they are said to

jar, or to produce discord. To make this explanation of harmony and discord the more intelligible, the following simple experiment may be made.

Suspend a ball of thread and poise it in the air, giving it a push with your finger. If you wish to carry on the swinging motion, you must wait till the ball is on the point of turning before you give it another push. If you touch it in the middle of a swing you will cause it to stop. This is exactly the case with the air which is swung by a harp-string, or put in motion by a flute; for in this respect wind-instruments are the same with the harp. The first case illustrates harmony; the last, discord.

On these principles, we imagine that a person who is deaf, if his eye were sufficiently quick, might perhaps be able to tune a harp or a piano-forte with tolerable exactness. We are not indeed aware of any instance of this, and merely hint its possibility.

ANIMATED SOUNDS.

Although none of the inferior animals can articulate, with the exception of parrots and a few other birds; yet almost every animal can emit some species of sound. Fish, indeed, so far as is known, are altogether mute. The organs of voice in the larger animals are more imperfect in their

powers of intonation, though similar in construction to those of man; and savages easily imitate the sounds of animals. In the same species, climate seems to have an influence over the voice, if it be true, as we are assured, that European dogs lose their power of barking when taken to the West Indies, where the native dogs cannot bark.

The sounds produced by insects are not the least observable among those which attract our attention in our walks.

Nor undelightful is the ceaseless hum,
To him who muses through the woods at noon;
Or drowsy shepherd, as he lies reclin'd.

THOMSON.

Insects, however, have not organs similar to those of the voice in other animals; that is, they never use their mouth for the purpose of making sounds. Accordingly, the buz of flies, the hum of bees, the chirp of crickets, the crink of grasshoppers, the drone of beetles, the whiz of dragon flies, the song of the cicâdæ, and the ominous click of the death-watch, are all produced by the wings, or other parts of the insect, either rapidly beating the air, or striking against the parts near them, or on wood, stones, and other sonorous substances. Some of the cicâdæ have a finely contrived drum, whose

beating in the Brazils may be heard at a mile's distance.

The variety of sounds produced by plants are also worthy of observation. The wind, as St. Pierre remarks, produces a different sound according to the form of the leaves. It whistles in the pine, trembles in the poplar like the babbling of a brook, sounds hollow in the oak, in the bamboo like the working of a ship, and in the cinnamon, when full of pods, like the clack of a mill.

Mr. White, in his very interesting history of Selborne, mentions a singular sound, which cannot be well referred either to plants or animals. It is like the loud, audible, humming of bees in the air, though not an insect is to be seen. In walking over the highest part of the Downs, he says, on a hot summer day, it would make a person suppose that a large swarm of bees was in motion, and playing about over his head. In wandering among the Swiss Alps, Saussure says he was often awakened from a sublime reverie by loud sounds, similar to thunder, followed by long-continued *roulemens* and echoes. These probably proceed from the falling of fragments of rock, and the descent of small avalanches, as the humming mentioned by Mr. White probably arose either from flights of aërial insects, or from some electrical or unknown commotion in the atmosphere.

SOUNDS INAUDIBLE TO CERTAIN EARS.

With the acuteness and caution which distinguish all his investigations, Dr. Wollaston has lately discovered the very singular fact, that there are many persons who never felt any defect in their hearing, and who yet cannot hear certain sounds, which others perceive distinctly.

It is well known that persons affected with slight deafness hear sharp sounds much better than those which are grave and low. They distinguish the voices of women and children, from their acuteness, much better than the lower tones of men's voices. This fact is acted upon practically, as it may be remarked, that those accustomed to speak to deaf people use a shriller note rather than a louder tone of voice.

This partial deafness may be artificially produced, by shutting the mouth and nose, and exhausting the air in the Eustachian tube, by a forcible attempt to take breath by expanding the chest. When this is carefully done, so that the exhaustion of the air behind the drum of the ear is as complete as possible, the external air is felt strongly and even painfully pressing on the drum; and the ear becomes insensible to low sounds, though shrill sounds are as readily perceived as before.

After the ear is brought into this state, it will remain so for some time without continuing the painful effort to take breath, and even without stopping the breath; for by suddenly discontinuing the effort, the end of the tube will close like a valve, and prevent the air from getting into the drum. The act of swallowing will open the closed tube, and restore the ear to its wonted feeling.

When the ear is thus exhausted, if we attempt to listen to the sound of a carriage passing in the streets, the rumbling noise cannot be heard, though the rattle of a chain or a loose screw remains as easily heard as before. At a concert the experiment has a singular effect. As none of the sharper sounds are lost, and the great mass of the louder sounds are suppressed, the shriller ones are consequently so much the more distinctly heard, even to the rattling of the keys of a bad instrument, or the scraping of catgut unskilfully touched.

In the natural healthy state of the ear, there does not seem to be any strict limit to our power of perceiving grave sounds. On the contrary, if we turn our attention to the opposite extremity of the scale, and, with a series of pipes exceeding each other in sharpness, if we examine the effects of them in succession upon the ears of any considerable number of persons, we shall find a very distinct and striking difference between the hear-

ing of different individuals, whose ears are in other respects perfect.

The suddenness of the transition from perfect hearing to total want of perception, occasions a degree of surprise which renders an experiment on this subject, with a series of small pipes, among several persons, rather amusing. Those who enjoy a temporary triumph, from hearing notes inaudible to others, are often compelled in their turn to acknowledge to how short a distance their superiority extends.

Dr. Wollaston found that one of his friends was quite insensible to the sound of a small organ pipe, which was far within the limits of his own hearing. He also remembers a relation to have said, that she never could hear the chirping of a hedge cricket. Two ladies of his acquaintance told him that their father could never hear the chirping of the common house sparrow. This is the lowest limit to acute hearing that he has met with, and he believes it to be uncommon; deafness even to the chirp of the house cricket is not usual; while it is by no means rare to find instances of people who are insensible to the shrill squeak of the bat.

The range of human hearing, comprised between the lowest notes of the organ and the highest *known* sound of insects, includes more than nine octaves, the whole of which are distinctly percepytible by

most ears. It may be inferred from these facts, without indulging in improbable conjecture, that insects, such as flies and crickets, whose powers appear to commence where ours end, may have the faculty of hearing sharper sounds than any which we know to exist; and that there may be other insects which may produce and hear sounds so sharp as to be beyond our conception.

LAENNEC'S EXPERIMENTS.

It may not be out of place nor uninteresting to notice here another order of sounds, "inaudible to certain ears," and lately rendered famous by M. Laennec. So long ago as the time of Hippocrates, the ear was applied to the chest to discover the extent of certain diseases of its cavity; this, however, M. Laennec says, is a very imperfect and objectionable method. Avenbrugger proposed percussion of the chest as an improvement, and in cases where there is little plumpness it is useful, though it requires expertness, to put it in practice.

M. Laennec's method consists in applying to the arm-pits, and other parts around the upper portion of the breast and back, a hollow cylinder of wood or cane, and approaching the ear to it while the person speaks or breathes forcibly. When the lungs are sound the voice extending through the

air contained in the lungs is distinctly heard through the cylinder; when the lungs are obstructed it is heard feebly, and sometimes not at all; when there is a cavity formed by an ulcer or otherwise, the voice is only heard when the instrument is applied near this cavity of the ulcer and in no other place.

HEARING BUT ONE SOUND WITH TWO EARS.

It has long been a question why we see but one object with two eyes; the same question may be put with respect to hearing, why we hear only one sound with two ears. It will not do to say it is because the two waves, or pulses of sound, arrive at each ear at the same instant, for this is seldom the case.

It has been erroneously explained in the case of the eyes, that the two nerves met previously to their arriving at the brain. In the case of the ears there is no circumstance of this kind to lay hold of, for the nerves of hearing go out from the brain considerably asunder.

This then is one of the circumstances which our present limited knowledge does not enable us to explain, and it is perhaps better to rest contented with knowing the fact, than to go into conjecture, and offer to God the folly of our own imaginations, instead of a history of his all-wise providence.

We know, however, farther, with regard to this phenomenon, that if close to the one ear a person sings an air, and close to the other ear another person sings a bass or a treble to that air, the two sounds will not be heard separately but combined in harmony. This is an experiment which it is very easy to verify. These facts are also illustrated by what has been observed concerning the double organs of taste and smell, the nerves of the tongue being separated by the middle furrow, and those of the nose by the partition of gristle.

DISTANCE OF SOUNDS.

Another inquiry is, how we come to know the distance and direction whence sounds come to our ears. This has lately been most ingeniously explained by Mr. Gough, in a paper published in the Manchester Transactions, who clearly demonstrates the *use* of two ears, though he does not determine the problem of single hearing.

The judgment which we form of the distance of sounds, proceeds, according to him, not from the loudness or lowness, but from what (for want of more explicit terms) he calls the roughness or smoothness of sounds.

Mr. Gough illustrates in what sense he uses these terms, from a person mistaking the sound caused by running the finger round the edge of a

glass vessel near him for that of a distant trumpet. The roughness of a sound is accordingly in proportion to its nearness, that is, its undiminished raciness of tone: a distant sound in its passage through the air loses this raciness which characterises its recent production.

This doctrine of Mr. Gough's is well and poetically illustrated by Sir Walter Scott:—

“ Ever, as on they bore, more loud
And louder rung the pibroch proud.
At first the sound, *by distance tame*,
Mellow'd along the waters came,
And, lingering long by cape and bay,
Wail'd every harsher note away;
Then bursting bolder on the ear,
The clan's shrill Gathering they could hear;
Those thrilling sounds, that call the might
Of old Clan-Alpine to the fight.”

LADY OF THE LAKE, C. II.

All this, however, is learned by experience, in the same way as we learn the distance of the objects of vision by touch. The first time a child hears a drum or a clap of thunder, he cannot discover from what the sound proceeds, nor can he discover that the sound is without his own ear, where alone he can feel the sound.

THE DIRECTION OF SOUNDS.

As the distance of sound seems thus to be learned by experience from its clearness and raciness, in a similar way as the distance of visional objects is determined by their distinctness or their haziness; so the direction of sounds seems to be discovered by the equality or inequality of tone with which they strike both ears.

A sound, for example, on the right side will strike most forcibly on the right ear, and we shall turn to that side to look for the sounding object. This may be illustrated by the experiment of completely stopping up one ear and listening to a sound made in a dark place at some distance. In this case we shall find it impossible to judge of the direction of the sound; with both ears we shall easily determine this in most circumstances, though the sight is of great use in assisting us to decide.

III.

CHANGES AND VARIETIES IN THE
EAR.

Like the eye and the brain, the organs of hearing are very fully developed in infancy and even at birth. The outer ear, though of perfect form, is small, and its gristly parts are soft and membranous. The bony portion of the outer passage is also wanting, and its place supplied by gristle and membrane. There is properly no mucous membrane to protect the drum, but a whitish coating of a similar nature is spread over it and the outer passage. The drum itself is very thin, though almost of the same proportional extent as in after life. The chain of bones and their muscles are precisely the same at birth and in manhood. Scarpa, Bichat, and Buisson made many minute observations on some of the parts adjacent to the chain of bones, with a view to discover the cause of deafness, but it does not appear that they had any success in their researches.

In the labyrinth the apparatus is almost perfectly developed; the vestibule and its oval hole,

the semicircular canals, as well as the snail shell, being firm, large, and well-formed.

The changes which principally take place in after-life are the enlargement of the cavity of the ear, and the greater hardness which the bones, muscles, and membranes acquire. In old age the moisture becomes less in quantity, the fluid of the labyrinth is sometimes wholly wanting, and it is supposed that this, and the greater rigidity of the small muscles, and the dullness of the nerve, are the causes of the deafness of old age.

The symptoms most distressing to old people are, tinglings, hissings, murmurings, buzzings, noises like the rustling of leaves, the blowing of wind, and the rushing of water; or like the jarring noise of a mill or threshing-floor, or the rattling of shingles on the sea-beach while a heavy wave is receding. These may be often caused by a superabundance of blood in the head; but the causes are not always discoverable, and to discover a remedy where the cause of a complaint is not known, is no easy task, except for an empiric. Purgatives, blisters, and blooding, are among those which are *tried*, and sometimes are successful.

Nothing in the structure of the ear, so far as observations after death may go, would lead us to conclude that in infancy the hearing should be, as

it for the most part is, very acute. Infants will start and appear alarmed at sounds which are far from loud to the adult ear. This, however, may arise as much from sensible nervous communication as from the ear being unduly acute. It is on this and similar affections observable in infants, that Lord Kames concludes, (most erroneously as we think) that infants have at birth a knowledge of the distinction between the soothing and the scolding of a nurse. We do not indeed think that an infant would be brought by habit to relish scolding and dislike soothing, because from the constitution of the nerves of the ear, harsh sounds are painful and smooth sounds pleasant; but this gives no countenance to the doctrine of our possessing a knowledge of this or any other thing at birth. We might as well assert, that at birth we have a knowledge of the pain produced by a wound, or of the pleasure arising from moderate warmth, which certainly cannot be known till it be felt.

It is well worth remarking upon this subject, that infants very soon appear to be delighted with the nurse's song, even long before they can articulate or comprehend a single word, and before they have any distinct notions of touch or sight.

HEARING OF THE INFERIOR ANIMALS.

The organs of hearing in the more perfect sorts of the inferior animals are, so far as the structure goes, perhaps better understood than in any of the other senses; not indeed on account of the simplicity of the parts or the facility of examining them, but from the greater minuteness of the dissections to which they have been subjected.

It is worthy of remark, that the form of the outer ear or funnel, is exceedingly well adapted to the habits of the different animals. The outer ears of hounds, swine, and other animals designed to hear low sounds, are either pendulous or moveable, to compensate for their difficulty of moving the head. For were their ears not so constructed, hogs, while eagerly digging for roots, and hounds, when keenly pursuing their game by the scent, might fall into danger, which their hanging ears readily intimates by catching the lowest sounds that float along the ground. In beasts of prey, the outer ear is directed forward; in timid animals again, who are always in danger of attack, the outer ear is very large and usually directed backwards, though it is very moveable. The ass and the hare are notable examples.

Birds have, correctly speaking, no external ear, except a tuft of stiff feathers placed close to the

entrance of the ear. A funnel like that of quadrupeds would have obstructed their rapid motion through the air in flying. The tuft of feathers, from being non-conductors of sound, must tend to impede their hearing, were this not compensated by the provision which is made to them for a different purpose, namely, for rendering them buoyant. This was first accurately investigated, if not discovered by Mr. John Hunter, who found that the air-vessels did not, as in other animals, terminate in the lungs, but extended in numerous branches through the whole body, even to the bones themselves. From the facts therefore formerly stated, it may fairly be concluded that the vibrations of the air, or the sounds which are stopped or muffled by the feathers of the bird, will be rendered more distinct from the great quantity of air contained in all parts of the body.

The ear of the whale is of similar conformation to that of man ; though externally it is very small, to facilitate the motion of the animal through the water. Its great singularity, however, is, that it can at pleasure shut up the passage by a hard substance of about an inch long, which acts as a moveable valve.

The ear of insects has not been discovered, but they certainly do hear. In the lobster it is placed at the root of the antennæ or feelers ; does this au-

thorize us to say that it is so in bees and ants? Bees are said by Virgil to be injured by certain sounds, particularly by echoes; but Mr. White of Selborne, one of our most accurate observers of nature, thinks the opinion incorrect, as he never observed the bees in his neighbourhood where echoes abound to be thus injured.

MUSICAL ANIMALS.

Animals are found to be strangely affected with some species of sounds. Certain notes, for example, sounded on a flute or other wind-instrument will cause a dog to set up a lamentable howl, evidently from the pain it produces either in the ear itself or the nerves connected with it. The war-horse seems to derive new life and vigour from the sound of the drum and the trumpet; and at the Circus the horses will not pace regularly without music. Outrageous bulls have likewise in several instances been calmed into gentleness by music. Of this musical feeling in oxen, Mr. Southey gives a singular instance in his letters from Spain. The carts of Corunna make so loud and disagreeable a creaking with their wheels for want of oil, that the governor once issued an order to have them greased; but it was revoked on the petition of the carters, who stated that the oxen liked the sound, and would not draw without its music. Even fish,

upon good authority, independent of Amphion and the dolphin, are said to have shown signs of being affected by music ; and seals crowded to hear a violin, as we are told by Mr. Laing in his voyage to Spitzbergen. *Gaudebant carmine Phocæ*, says Valerius Flaccus, which Sir Walter Scott translates :

“ Rude Heiskar’s seals through surges dark
Will long pursue the minstrel’s bark.”

In Germany they take the shad by means of nets, to which bows of wood, hung with a number of little bells, are attached in such a manner as to chime in harmony when the nets are moved. The shad once attracted by the sound will not attempt to escape while the bells continue to ring. Elian says that the shad is allured by castanets.

We now prepare to give you some facts, which you may consider as a trial of credulity ; but the authority on which they rest is far from being destitute of respectability. Naturalists assert, that animals and birds, as well as “ knotted oaks,” as Congreve informs us, are sensible to the charms of music. For example, an officer, who was confined in the Bastille, begged the governor to permit him the use of his lute, to soften his prison confinement by the harmonies of his instrument. At the end of a few days this modern Orpheus, playing on his

lute, was greatly astonished to see frisking out of their holes great numbers of mice, and descending from their woven habitations crowds of spiders, who formed a circle about him while he continued breathing his soul-subduing instrument. His surprise was at first so great that he was petrified with astonishment; when, having ceased to play, the assembly, who did not come to see his person but to hear his instrument, immediately broke up. As he had a great dislike to spiders, it was two days before he again ventured to touch his instrument. At length, having conquered, for the novelty of his company, his dislike of them, he recommenced his concert, when the assembly was by far more numerous than at first; and in the course of farther time, he found himself surrounded by a hundred musical amateurs. Having thus succeeded in attracting this company, he treacherously contrived to get rid of them at his will. For this purpose, he begged the keeper to give him a cat, which he put in a cage, and let loose at the very instant when the little hairy people were most entranced by the Orphean skill which he displayed.

The Abbé Olivet has described an amusement of M. Pelisson, during his confinement in the Bastille, consisting in feeding a spider which he discovered forming its web in the corner of the small window. For some time he placed his flies at the

edge, while his valet who was with him played on a bag-pipe : little by little, the spider used itself to distinguish the sound of the instrument, and issued from its hole to run and catch its prey. Thus, calling it always by the same sound, and placing the fly at a still greater distance, he succeeded after several months to drill the spider by regular exercise, so that it at length never failed to appear at the first sound to seize on the fly provided for it, even on the knees of the prisoner.

M. Marville has given us the following curious anecdote on this subject. He tells us, that doubting the truth of those who say it is natural for us to love music, especially the sound of instruments, and that beasts themselves are touched with it, being one day in the country he inquired into the fact ; and, while a man was playing on the trumpet, made his observations on a cat, a dog, a horse, an ass, a hind, cows, and small birds, and a cock and hens, which were in a yard under a window on which he was leaning. He did not perceive that the cat was the least affected, and he even judged by her air, that she would have given all the instruments in the world for a mouse, sleeping in the sun all the time ; the horse stopped short from time to time before the window, raising his head up now and then, as he was feeding on the grass ; the dog continued for above an hour

seated on his hind legs, looking steadfastly at the player ; and the ass did not discover the least indication of his being touched, eating his thistles very peaceably ; the hind lifted up her large wide ears, and seemed very attentive ; the cows slept a little, and after gazing, as though they had been acquainted with us, went forward ; some little birds which were in an aviary, and others on the trees and bushes, almost tore their little throats with singing ; but the cock, who minded his hens, and the hens who were solely employed in scraping a neighbouring dunghill, did not show in any manner that they took the least pleasure in hearing the trump marine.

A modern traveller assures us, that he has repeatedly observed in the island of Madeira, that the lizards are attracted by the notes of music, and that he has assembled a number of them by the powers of his instrument. He tells us also, that when the negroes catch them for food, they accompany the chase by whistling some time, which has always the effect of drawing great numbers towards them. Stedman, in his expedition to Surinam, describes certain sibyls among the negroes, who among several singular practices can charm or conjure down from the tree certain serpents, which will wreath about the arms, neck, and breast of the pretended sorceress, listening

to her voice. The sacred writers speak of the charming of adders and serpents; "and nothing," says he, "is more notorious than that the eastern Indians will rid their houses of the most venomous snakes, by charming them with the sound of a flute which calls them out of their holes. These anecdotes, which may startle some, seem to be fully confirmed by Sir William Jones, in his curious dissertation on the musical modes of the Hindoos.)

"After food, when the operations of digestion and absorption give so much employment to the vessels, that a temporary state of mental repose must be found, especially in hot climates essential to health, it seems reasonable to believe that a few agreeable airs, either heard or played without effort, must have all the good effects of sleep, and none of its disadvantages; putting the soul in tune, as Milton says, for any subsequent exertion; an experiment often successfully made by myself. I have been assured by a credible eye-witness, that two wild antelopes used often to come from their woods to the place where a more savage beast, Sirajuddaulah, entertained himself with concerts, and that they listened to the strains with an appearance of pleasure, till the monster, in whose soul there was no music, shot one of them to display his archery. A learned native told me that he had frequently seen the most venomous and malig-

nant snakes leave their holes upon hearing tunes on a flute, which, as he supposed, gave them peculiar delight. An intelligent Persian declared, he had more than once been present when a celebrated lutanist, surnamed Bulbul, that is, Nightingale, was playing to a large company in a grove near Shiraz, where he distinctly saw the nightingales trying to vie with the musician, sometimes warbling on the trees, sometimes fluttering from branch to branch, as if they wished to approach the instrument, and at length dropping on the ground in a kind of ecstasy, from which they were soon raised, he assured me, by a change in the mode."

IV.

NATURE OF A MUSICAL EAR.

One of the circumstances well known in fact, but as yet unexplained by anatomy, is that which is observable in individuals called a musical ear. M. Le Cat says, the ear of a good musician is a sort of prism, which separates and distinguishes the tones combined in harmony, as the glass prism separates the colours of light. This is no less fanciful, we think, than a comparison between

sound and colours—scarlet, for example, being compared to the sound of a trumpet.

The most singular and ingenious account which we have met with, of the peculiarity of a musical ear, is given by Professor Brown, of Edinburgh, in his Lectures on the Philosophy of the Human Mind. He thinks, because people who are not musical can distinguish grave and acute, low and loud sounds, as well as a musician, that the peculiarity must lie in the comparison of successive sounds; and he illustrates his meaning by the ticklishness, or the want of it, in certain parts of the skin. The whole passage is so curious that we shall give it in his own words :—

“ The phenomena of music, in addition to their general interest, are truly worthy, in another respect, of our astonishment, from that striking diversity of organic power in the perceptions of melody, and still more of harmony, which they exhibit in different individuals, in whom all other circumstances are apparently the same,—a diversity which has often attracted the attention of philosophers, and has led even those who have no great tendency to speculation of any kind, to wonder, at least, which is the first step to philosophizing. In the present instance, however, unfortunately, this first step is the only step which philosophers have been able to take. They have been

obliged to desist, after all their efforts to proceed further, and to submit to share, and even to acknowledge that they share the ignorance of the vulgar.

“If, indeed, the want of a musical ear had involved either a general defect of hearing, or a general slowness of discrimination in other cases of nice diversity, the wonder would not have been great. But those who are without ear for music, perceive, as readily as others, the faintest whisper; they distinguish, like them, the faintest shades of difference in mere articulations of sound, which constitute the varieties of language, not the articulation only, but the differences also of the mere tones of affection or displeasure, grief, or gaiety, which are so strikingly analogous to the varied expressions of musical feeling: and their power of discrimination in every other case, in which the judgment can be exercised, is not less perfect. Nay, to increase still more the difficulty, they are often as sensible as others, of the beauty of series of tones of a different kind; and some of our best poets and declaimers, who of course must have had a quick discernment of metrical rhythm, and of the melody of elocution, have yet been incapable of distinguishing the musical relations of sounds, as reciprocally high or low, the melody

that results from them in certain succession, and the harmony or the discord of their union.

“ That it depends, chiefly, or perhaps entirely, on the structure or state of the mere corporeal organ of hearing, which is of a kind, it must be remembered, peculiarly complicated, and therefore susceptible of great original diversity in the parts, and the relations of parts that form it, is very probable; though the difference of the separate parts themselves, or of their relations to each other, may, to the mere eye, be so minute as never to be discovered by dissection, thus leaving to every future race of inquirers, the same difficulty which has perplexed ourselves, and the same difficulty of overcoming it.

“ In the sense of vision, we may remark, there is a species of defect, very analogous to the want of musical ear—a defect which consists in the difficulty, or rather the incapacity of distinguishing some colours from each other, and colours which, to general observers, seem of a very opposite kind. As the want of musical ear implies no general defect, in like manner it is to be found in persons, who are yet capable of distinguishing with perfect accuracy, the form, and the greater or less brilliancy of the coloured object; and we may remark, too, in confirmation of the opinion,

that the want of musical ear depends on causes not mental but organic; that, in this analogous case, some attempts, not absolutely unsuccessful, have been made, to explain the apparent confusion of colours, by certain peculiarities of the external organ of sight. Though the one case, however, were to throw no light upon the other, it is still gratifying to philosophers to have a case at all analogous, to which, when they are weary of considering what has baffled all their endeavours to explain it, they may have the comfort of turning away their attention without the mortification of seeming absolutely to fly from the subject. Such is the strange constitution of our nature, that merely to have another difficulty presented to us, though it may yet be absolutely insurmountable in itself, if only it have some slight resemblance to a former difficulty, seems to us almost as if we had succeeded in explaining the first; and each difficulty, by a very convenient transposition, which our pride knows well how to make, supplies, according as we may have been considering the one rather than the other, the place of explanation to that which is afterwards to explain it, no less clearly in its turn.

“ The phenomena most analogous to the affections of the ear, as depending on successive impulses, are unquestionably the phenomena of titillation, or

rather, to express what is so familiar and simple, by a more homely and appropriate word, the phenomena of tickling. In this the great circumstance distinguishing musical feeling is to be found, that the feeling arises not from the separate impressions, but from their successions or co-existence. When the palm of the hand is gently tickled, as the finger passes rapidly and repeatedly over the palm, the parts first affected are again affected with various degrees of pressure, as the ear, in melody, is successively affected by repeated varieties of vibration; and the various parts of the organ of touch exist, at the same moment, in various states, forming one joint result of sensation; as in harmony, various vibrations of the organ of hearing co-exist, and blend together in one mingled delight.

“To produce tickling, a certain rapidity of succession is necessary; for, if the parts first affected have returned to their original state before other parts begin to be affected, or themselves to be affected again, the slow motion, it is evident, may be continued for any length of time, without any effect different from that of simple pressure. The quicker, then, the return of the parts may be to their original state, the less will be the titillation; and it is, very probably, a difference in this quickness of return which constitutes the difference of

ticklishness, so remarkable in different individuals, who feel equally the light pressure of each separate touch. That there is a difference of ticklishness in different persons is well known; some being easily excited even to convulsive laughter by slight motions, that scarcely produce any effect in others beyond that of the simple primary sensation of touch. A person who is ticklish, and a person who is not ticklish, agree in receiving this first tactual sensation; but they differ afterwards in this respect, that when the same slight impulse is rapidly repeated on the same surface, it produces a livelier effect than before in the one, but not in the other. The organ of the one who is not ticklish is in the same state, or nearly in the same state, when it receives the second, third, and fourth impression, as when it received the first, and no peculiar excitement, therefore, is produced. The organ of the other more susceptible, or more tenacious of the affection produced, has not returned to its original state when the rapid impression is repeated, and is, therefore, at every new impression affected in a different manner.

“Proceeding on the analogy of these phenomena of mere tickling—an analogy which, striking as it is in many circumstances, does not justify more than conjecture in this application, it may be conceived to be at least not absolutely impossible,

since a diversity of some kind there must be, that in those who receive no pleasure from music, as in those who are not ticklish, there is a rapid return of the nervous organ, after each separate touch or pressure in the one case; and each separate tone in the other case produces its particular effect—that effect which it would have produced in all, if unaccompanied by any other tone in music, or slight pressure in tickling, but that a succession of these produces no effect different from that which each would have produced singly. A certain interval is necessary for distinct hearing in every case; and, before this interval has passed, the auditory nerves, in this case, may be imagined to be quiescent, or nearly quiescent.

“In an inquiry of this sort, all which is necessary, is to account for the mere original defect of pleasure; since, if the relations of notes, as reciprocally high or low, never gave any delight, the ear, having no object of interest in these successions, would soon habitually neglect them, and at length cease altogether to distinguish them, attending only to the verbal meaning of sounds, and not to their tone; in the same manner as we pay little attention to another relative difference of voices as more or less loud, unless when the difference is very considerable, and not in those common differences of intensity which distinguish every voice in conver-

sation from every other voice ; or as, after living long in a province, the dialect of which is distinguished by any accentual peculiarities, we at last become unconscious of these, and hear the words, as it were, stripped of their peculiarity of tone. In what is termed the cultivation of a musical ear, however, we have not an analogy merely, but a direct proof of this influence of habit.

“ That the ear may be improved by cultivation, or, in other words, by nice attention to the differences of musical sounds, every one knows ; and if this attention can enable us, even in mature life, to distinguish sounds as different in themselves, which, but for the habitual attention, we should have regarded as the same, it may well be supposed that continued inattention from earliest infancy, may render us insensible of musical relations still more obvious and precise than those which we have thus only learned to distinguish ; or, which is the same thing, that continued attention from infancy to slight musical differences of sound, —an attention which may be regarded as the natural effect of pleasure received,—may render us capable of distinguishing tones as very dissimilar, the difference of which, however obvious at present, we should scarcely, but for such original attentive discrimination, have been able to detect. What, in comparison, the refined ear of a performer, almost

every moment of whose life has been spent amid sounds,

“Untwisting all the chains that tie
The hidden soul of harmony,”

is to a common musical ear, that common musical ear may be to those in whom this discriminating skill seems to be wholly or nearly defective. The refined musician, who, but for the long practice of his art, would have shared that incapacity which now excites his wonder, is astonished that persons of a common ear do not distinguish the nice differences, which appear to him almost as remarkable as those differences which they are capable of perceiving; and the person of common musical ear only does the same thing, when he is astonished that the less refined differences remarked by himself are not obviously distinguishable by all mankind, or at least by all who have no deafness to incapacitate them from hearing the separate sounds. The discrimination in both has depended on previous attention, which has necessarily been greater in the one case than in the other: and what attention can we suppose to have been originally given, if, from the cause which I have ventured to state as a possible one in persons without musical ear, no pleasure had originally been felt by them in any sequence of notes as successive, and the whole value of sound been to them the meaning of which

it was symbolically representative, which, accordingly, they have learned to discriminate in every other case as accurately as others?"

PHRENOLOGICAL ORGAN OF TUNE.

According to the phrenologists, the organ which distinguishes music is not in the ear at all, but at the corner of the eye-brow; for the *organ of Tune*, as they term it, bears the same relation to the ears, as the organ of colour (which is placed, not in the eye, but in the centre of the eyebrow) does to the eyes. The ear receives the impressions of sound, and is agreeably and disagreeably affected by them; but the ear has no recollection of tones, nor does it judge of their relations; it does not perceive the harmonies of sound; and sounds as well as colours may be separately pleasing, though disagreeable in combination. A great developement of the organ enlarges the lateral parts of the forehead; but its form varies according to the direction and form of the convolutions. Dr. Spurzheim observes, that in Glück, and others, this organ had a pyramidal form; in Mozart, Viotti, Zums-teg, Dusek, Crescentini, and others, the external corners of the forehead are enlarged, but rounded. Great practice is necessary to be able to examine this organ successfully; and beginners should place together one person possessing a genius for

music, and another who can scarcely distinguish between two notes, and mark the difference of their heads. The superior developement of the former will be perceptible at a glance. The faculty gives the perception of melody. Tune is necessary, in addition, to produce perfect music.

Dr. Spurzheim mentions, that the heads and skulls of birds which sing, and of those who do not sing, and the heads of the different individuals of the same kind, which have a greater or less disposition to sing, present a conspicuous difference at the place of this organ. The heads of males, for instance, and those of females of the same kind of singing-birds, are easily distinguished by their different developement.

It appears to us, however, that this organ of tune might, with as much if not more propriety, have been placed in the foot, which the musician so frequently uses to beat time; and according to the principles on which phrenology is founded, a musician may be known from the superior size of the muscles which move the foot in beating time! In a similar way we could improve, if we had leisure, on many of the other organs recognised in this system—but we must for the present forbear.

IMPROVEMENT OF THE EAR.

The first step for improving a musical ear is the correct appreciation of the intervals of notes, which is most speedily and effectually accomplished, according to our experience, by learning to tune any stringed instrument with accuracy. A minuteness of tact is thus acquired, which no other exercise can ever produce. The violin, the harp, the guitar, &c. may be made choice of for this purpose, and the tuning taught and practised independent at first of any efforts to play ; for we think it quite possible to teach tuning separately from playing, and think that this would be a great improvement on musical education.

Madame Mara was originally taught the violin, which, we have no doubt, accounts in part for her fine delicacy of ear. “Had I a daughter,” said she, “I would have her taught the violin before she sung a note ; for how,” continued she, “can you best convey a just notion of slight variations in the pitch of a note ? By a fixed instrument ? No. By the voice ?—No. But by sliding the finger upon the string, you instantly make the most minute variation visibly as well as audibly perceptible.” The principle is unquestionable, and we must urge the practice to be carefully followed

up by all who are anxious to improve their musical perceptions and their ear for music.

MELODY.

Exercise is so powerful over the ear, that we have more than once known those who were supposed to be destitute of musical taste, and even to have little or no ear for the simplest airs, become in a short time capable of both understanding, feeling, and remembering airs that were far from being simple in their character. Those to whom it is an object of desire to have a taste for music, should not despair, even if unsuccessful in their first attempts, for perseverance will in most cases overcome all difficulties. The following are, we think, striking instances in point, which are given in the *London Magazine* for December, 1824. "I knew at Paris," says the writer, "the widow of an Irish patriot, who could not hear the 'Exile of Erin' sung without being overpowered to such a degree, that it would have been truly alarming, had not a flood of tears come to her relief. What is wonderful,—so far from having a fine musical ear, she had not even a common-place relish for music. The same effect was produced on her by the 'Minstrel Boy,' of Moore." P. a young friend of the same writer, who has no taste for music, is

similarly overpowered even in a crowded theatre, when 'Home, Sweet Home,' is sung. The author accounts for it from Dr. Brown's principle of present perception, which, by its impress of reality, renders more intense the entire group of associated feelings. We think that it more probably arises from a latent musical taste, not developed by practical discrimination.

The exercises for improving the ear will be best pointed out by a master; but without the accurate and persevering practice of tuning, we are of opinion that even the finest natural ear will be deficient in delicacy and accuracy. Intonation, as Mr. Bacon remarks, is the highest possible requisite of a singer; and the main impediment that stands in the way of obtaining this is ignorance of the desired interval. It is indeed a received opinion, that to sing the scale in perfect time is, as it were, an act of simple uninformed nature; whereas, in truth, it is purely an act of imitation. There can be no doubt, consequently, that to blend the tuning of an instrument with the practice of the first elements, must be useful, if not indispensable. We have observed the effect so often that we cannot hesitate in thinking that a variation from the pitch frequently proceeds from an erroneous notion of the interval, rather than from any failure in the organ to obey the will. This, from habit, becomes

inveterate, and confirms occasional errors, so that even good singers sometimes find it impossible to correct an original misapprehension of a particular passage or note caught from first learning the air by an instrument out of tune.

Much depends on the communication of the first principles in the first few lessons. Most amateurs are destroyed at the outset. Some assistance in attaining the knowledge of intervals may be afforded by the power of numbers and an acquaintance with the arithmetical differences between the notes of the scale. Figures, indeed, will convey no accurate sensible idea through the ear; but a knowledge of the precise relations will instruct the mind and act as a coadjutor to that organ. In the same way a general notion of *temperament* may be given, and the beautiful effects of particular keys upon a fixed instrument, illustrated, and the necessary compliances and deviations pointed out. We may admit the general truth of the common rule, that all keys are alike to a singer; but we must also admit that a conformity to temperament is both frequently necessary, and that it often heightens the expression of a song. For, if this is not the case, why do composers select particular keys; why prefer A with flats, to A with sharps, and the contrary? The melancholy effect of the one and the brilliancy of the other are entirely

produced by the temperament. It should seem, therefore, that a defect may be softened into a beauty, though the possession of this power can only consist with an accurate understanding of the differences, which can be communicated by no other means, so rapidly and so certainly as by practically tuning some stringed instrument, as has just been recommended.

The counting of time, in its various modifications, is considered a criterion of the correctness of the ear. All knowledge of sound is acquired by imitation and comparison; no verbal definitions of time, unassisted by practical demonstration, can ever convey any precise ideas, nor does the ear arrive at the power of distinguishing without much practice. This faculty is, therefore, scarcely to be considered simply as an act of the ear. We compare two sounds, indeed, by means of the ear; but we remember certain rules by which we are to determine, and which must be founded on ideas acquired from art. A singer never fails to adopt the scale of that instrument by which he has been taught. Scholars are addicted even to the faults of their masters. It is, therefore, apparent that in the formation of the ear, as much depends upon instruction as upon nature; and the excellence or defect of the ear can only be ascertained during the progress of tuition, by careful and repeated trials.

HARMONY.

The just appreciation of harmony is a more advanced step in the process of cultivating the ear. An uninstructed person, however fine his natural ear for music, can have no proper relish for the music of the full orchestra; for this plain reason, that he cannot understand it, and is confounded rather than delighted. It requires both practice and much observation and experience to acquire a taste for this; for we think it quite possible to have an exquisite taste for simple melody, without the least relish for the complicated harmony of a full concert, or the display of the art of counterpoint.

V.

DEFECTS AND DISORDERS OF THE
EAR.

In our sketch of the anatomy of the ear we have already taken occasion to allude to some of the defects and disorders to which the ear is liable; but we think it will be proper to consider these a little more in detail, in order to give our readers a more complete guide to direct them in their

professional avocations, which must always suffer from any defect or disorder in this important organ. From the complicated organizations of the ear, indeed, it follows necessarily, that, like the eye, it must be subject to a great variety of diseases, while many of the diseases of one sense must bear a close analogy to those of the other. As the eye, for example, is sometimes affected with illusory objects, so is the ear with illusory sounds; and painful and obtuse hearing may well be compared with painful and obtuse vision and blindness. As the organ of the ear, however, is less exposed than that of the eye, we are far less acquainted with the immediate seat of its diseases, and even with the exact bearing which every particular part sustains in the general phenomena of hearing. At one time, for instance, it was imagined that the faculty of a musical ear was seated in the cochlea, but it was discovered that singing-birds, whose musical ear is so exquisite, have no cochlea. Again, it was conjectured by Sir Everard Home, that the faculty resided in the membrane of the drum. Unfortunately for this conjecture, it was found that individuals retained their musical ear in perfection after this membrane was ruptured.

DEAFNESS AND HARDNESS OF HEARING.

Defects of this kind may arise, as we have formerly seen, from obstruction at birth, or by accident in some of the tubes or canals of the ear, or weakness or palsy in the nerves; and it depends entirely on the cause, and on properly ascertaining it, whether any temporary amendment or permanent cure can be accomplished.

DEAFNESS FROM THE BIRTH.

The organs of hearing are indispensable to speech, for if sounds be not distinctly heard and discriminated, they can never be imitated. Those who become deaf, after being able to speak, therefore, do not become dumb because articulation has become a habit, which practice can preserve. But in deafness from the birth, no interchange of ideas can take place except through the eye and the touch. The impediment may exist in the outer or inner entrance, or in the cavity of the ear. In a few instances the outer entrance of the ear has been completely closed, though it is more commonly obstructed by hardened wax or some other substance. The Eustachian tube has also been found closed up either by mucus, or by the enlargement and pressure of the tonsils, or almonds of the throat. Should the obstruction exist in the

internal cavity of the ear, the cause can rarely be discovered during life, from the impossibility of examination.

Few instances are recorded of recovery from deafness many years after birth, though instances have sometimes happened. Thus Lambzweerde relates the case of a fortunate fracture of the scull, in consequence of a fall from a considerable height, by which a young person deaf and also dumb from birth, suddenly acquired the power of hearing, and afterwards learned to speak. In the *Philosophical Transactions*, likewise, Mr. Martin gives an account of a native of Stratherig, near Inverness, named Fraser, who was born deaf and continued dumb till he was seventeen years of age, when he was attacked with fever, which affected his brain, and on recovering, he acquired the sense of hearing.

We have already seen that when the Eustachian tubes are imperforate, a partial substitute has been discovered by perforating the membrane of the drum. The defect is discovered by the absence of the sense of swelling in the ears, which otherwise takes place on blowing the nose violently.

NERVOUS DEAFNESS.

This often occurs as a symptom in weak individuals in fevers, headache, apoplexy, palsy, &c. and

has followed on drinking cold water, or by plunging the head in cold water, during great heat and perspiration; by a long exposure to loud or deafening noises, or the sudden and unexpected burst of some vehement sound upon the ears, as that of a cannon or a thunder-clap, when the constitution is in a great state of nervous irritability; and in such a state deafness has also been known to arise from a violent fright, or vehement sneezing. When the outer passage of the ear also is so weak as to be unable to manufacture a due supply of wax and moisture, a similar deafness ensues. What is called palsy of the nerves of the ear, or paralytic deafness, is only an aggravated state of the disorders which we have just described, and is consequent upon the same causes.

The causes of these kinds of deafness are frequently beyond the power of the medical art to remove or ameliorate, and the disease for the most part continues for life. When it clearly depends on debility, stimulant and tonic remedies may be tried sometimes with success, though it must be confessed that they frequently disappoint our hopes. Morgagni, a celebrated Italian physician, recommended the smoke of tobacco to be drawn into the mouth and forcibly pressed into the Eustachian tubes by closing the lips and nostrils, and then strongly sniffing it towards the palate. This

sometimes takes off the spasm causing deafness, and the patient is startled with the sensation of a smart snap, as if something had broken. One of the most powerful stimulants in deafness of this kind is galvanism, or electricity, applied two or three times a-day for half an hour or longer, and persevered in for many weeks. A series of small blisters behind the ears and renewed as soon as they heal, or kept open by blister ointment, has often proved beneficial. In the *Edinburgh Medical Commentaries*, Mr. Gordon relates a case of total deafness, produced suddenly on a soldier in good health, by his plunging overhead into the sea, which, after a long routine of medicines had been tried in vain for three months, yielded to the use of mercury as soon as the mouth began to be affected, and in six weeks from his entering upon the mercury, his hearing was perfectly restored. Much will depend on the earliness of the treatment, for in the first stage there is much more chance of a cure than when it is confirmed.

After all, however, it must be confessed that it is extremely difficult to find any efficient remedy for nervous deafness, in consequence of the causes being so very obscure. It has been proved by dissections after death, that total deafness may exist without any apparent defect in the mechanism, either of the external or the internal ear. On

examination of such persons as have been deaf for life, every part of the ear has appeared perfect. Even the nerve and its expansion showed no trace of disease; and the disorder, whatever it may have been, was too minute for either the knife or the eye to detect.

DEAFNESS FROM ACCIDENTAL OBSTRUCTION.

When dust or other foreign matter get into the ear they combine with the wax, and form hard masses of stuff which often completely plug up the outer passage, and of course prevent sounds from striking on the membrane of the drum which renders the person deaf. This often happens to persons who are much exposed to dust, &c. and is therefore prevalent among cotton-spinners from the flue of the cotton, and among bakers, millers, stone-masons, bricklayers, plasterers, statuaries, snuff-makers, &c. from the dust occasioned by their business. To those who are in the habit of taking snuff, the Eustachian tube which opens at the back part of the nostrils, is often obstructed in a similar manner, and causes hardness of hearing.

The cure of these obstructions, when not of too long standing, is for the most part easily effected by means of the syringe and tepid water. Once or even twice syringing, however, will seldom be

sufficient to soften the hardened substance that causes the obstruction. Accumulations of wax may also be softened by oil of almonds and spirit of wine, which will dissolve whatever resinous part it possesses.

EAR-TRUMPET.

When hardness of hearing is habitual and cannot be radically cured, we must endeavour to diminish the evil by advising a hearing-trumpet,—an instrument formed on the same acoustic principle with the external ear itself, its object being to collect a large body of sonorous vibrations, and transmit them to the membrane of the drum in a concentrated state, by means of a convergent tube ; or, in other words, to increase as much as possible the vibratory power of the sound. Now sound being, as we have seen above, propagated in straight lines, persons partially deaf will always hear most distinctly when directly opposite to the speaker. For the same reason, the ear-trumpet should be formed as nearly as possible in a straight line ; though for the sake of convenience, we have to deviate from this principle and bend the tube into the segment of a circle, by which some degree of power is always lost. The metal of which the tube of the ear-trumpet is made, should be that which is found

to be most sonorous, or, in other words, which most completely reflects instead of absorbing the sound ; and while the funnel or large aperture is as wide as possible, the extreme end of the pipe can scarcely be too small.

DISORDERED HEARING.

Under this head we shall rank some of those affections of the ear which could not properly come under deafness, although they do sometimes very much impede or derange the clear perception of sounds.

IMAGINARY SOUNDS.

As the eye is frequently, in consequence of disordered nerves, subject to illusions of objects which have no real existence, the ear is also liable from similar causes to illusory sounds of various kinds, which are productive of much uneasiness to the person affected. The sounds produced are various in different persons, arising no doubt from variations in the causes, though these can seldom be explained. In some cases these imaginary sounds seem to resemble the murmuring of water ; at other times they may be compared to the hissing of a tea-kettle as it boils over ; on other occasions they are represented by the patients as like the rustling

of leaves, the blowing of wind, the sound of distant bells, &c.; all of which are to be considered as false perceptions in the ear. There is one species of this affection which represents a beating noise, like that of the pulse—a noise which is increased by any augmented excitement of the current of the blood.

The treatment recommended is to fumigate the ears with the vapour of a hot vinous infusion of rosemary and lavender, or the fumes of tobacco, employed as directed in nervous deafness. Other local stimulants also may be tried, such as spirits of wine, ether, camphorated spirits, and tincture of myrrh, of amber, or of balsam of tolu;—or tonics, such as cold water and solutions of alum, zinc, &c. Laudanum may also be introduced into the ear, and a blister applied and kept open behind.

DOUBLE SOUNDS.

In some cases, which however are rather rare, the feelings of one ear are not in unison with those of the other, but the same sound is heard distinctly by each ear in a different key; a disorder similar to the double vision of the eyes, which is sometimes met with. Sauvages, a celebrated French author, has given some curious cases of this affection. A musician while blowing his flute, heard two distinct

sounds in every note in different keys, and as they were heard simultaneously, the one could not be an echo of the other. On another occasion, Sauvages was consulted by a person who heard two distinct voices whenever he was spoken to, the one at least an octave higher than the other, but not in concord with it. As this affection is evidently dependant on the nerves, it must be treated as we have directed under nervous deafness.

SOUNDS TOO LOUD.

From great sensibility occurring in the nerves of the ears, sounds are sometimes felt to be painfully loud. This affection is frequently found accompanying ear-ache, head-ache, epilepsy, and various kinds of fevers. Dr. Good says the feelings are sometimes so acute as to render intolerable the whisperings of a mere current of air in a room, or the respiration of persons present, while noises before unperceived become highly distressing. He mentions the case of a young lady, who informed him that her eyes and ears were so connected by sympathy, that a loud sound affected her eyes and a strong light her ears, so that she was obliged to darken her room when she heard any thing like a noise, and the least sound seemed almost as loud as thunder, while a really loud noise was as if she

had received a blow in the very centre of the brain. Dr. Good recommends cold water, or even pounded ice, laudanum, &c. We should have more faith in the extract of belladonna.

THE END.

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